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THE

PHOTOGRAPHIC NEWS:

A WEEKLY RECORD

OF THE

PROGRESS OF PHOTOGRAPHY.

VOLUME XXVIII.

Nulla recordanti lux est ingrata.—MARTIAL.

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THE PHOTOGRAPHIC NEWS.

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CONTENTS.

THE OLD YEAR AND THE NEW.

No progress has been made during the past year in several branches of photography, and especially in those processes which make the printing machine, whether typographic or lithographic, a means of rapidly multiplying photographs. The ink photographs of Sprague are in reality photographs, and are rapidly printed by the usual steam lithographic machine. The first picture by Sprague's process which was issued with a photographic journal appeared as a supplement to the PHOTOGRAPHIC NEWS on December 8th, 1882, and the numerous photo-ink supplements which we have issued during the past year serve to prove the wide applicability of the method in question. Sprague's method of photography has also been employed pretty extensively for the purpose of book illustration, and we have already noticed Fay's "Royal Road," and Neil's "Melissa's Victory," as examples indicating its value in this respect. Still we must not forget that photo-lithographs from nature are by no means new, as in 1866 we issued with the PHOTOGRAPHIC NEWS (No. 398) a photo-lithograph by Messrs. Bullock Brothers, of Leamington, and this appears to us fully equal, if not superior, to the work done at the present time by Messrs. Sprague (see Bullock Brothers' patent, No. 2954, 1865, and PHOTOGRAPHIC NEWS 1866, page 232). Why did not the process come into general use? May be asked. It is not difficult to give the answer. Eighteen years ago lithographic printing, especially by the steam machine, was somewhat neglected in England, and a photographer who had succeeded in producing a transfer with the required grain or stipple would have had a difficulty in finding a lithographer capable of putting it on stone or printing it satisfactorily; but now the case is different. There are several lithographic machine printers in London who can do justice to the highest class of work, and considering the comparative ease with which satisfactory transfers in stipple may be obtained, it is reasonable to expect a considerable advance in litho-photographic work during the coming year. From litho-photographic to typo-photographic printing is but a step, as any lithographic impression can be transferred to zinc and converted into a type block by etching away the uncovered parts with nitric acid. The notable progress made in this work during 1883 is so fully detailed in the PHOTOGRAPHIC NEWS and also the "Annals" of the YEAR-BOOK, that we need do no more than mention the names of Ives, Meisenbach, Woodbury, Zuccato, and Waterhouse, as having worked successfully in this direction.

The rapid production of photographic pictures by exposing successive portions of a band of sensitive material under a negative was referred to in our first number of the past year as a method likely to become important, and we found some admirable machine-exposed pictures of this kind in the Brussels Exhibition; while two "novel" exposing frames have been patented during the past year.

Major Waterhouse's important and thorough investigations on asphaltum in its relation to photo-mechanical methods can hardly fail to bring forth useful fruit; and indeed, we may refer to his series of articles on photo-lithography as being far more comprehensive and detailed than anything before published.

The need of accuracy in the use of terms, and uniformity as regards certain photographic dimensions, has long been felt, and something has been accomplished in the work of unification. The Photographic Society has established standards for screws and flanges, and it is to be hoped that more will be done by the Congress of photographers which is to assemble at Brussels.

The gelatino-bromide process has now become all but universal for ordinary negative work in England; and its application to the production of positive prints on paper—notably enlargements, but also small prints—is rapidly extending. Vigorous pictures are much more easily secured if the paper is enamelled with a composition of barium sulphate and gelatine, before the sensitive emulsion is applied.

The potash developer, as advocated by Stolze and Eder, appears to possess advantages, and many practitioners have adopted it. Full particulars as to its use have appeared in the PHOTOGRAPHIC NEWS; it will also be found in the YEAR-BOOK.

The view which judges now take regarding the law of copyright must be borne in mind by those who employ assistants to take negatives for them. If a master is present when a negative is taken, and assists by his directions or advice, he is the author of the photograph. Supposing, on the other hand, that the assistant is sent to take a negative of some distant scene, he is the author of the photograph, and the registration must be taken out in his name, the copyright being then transferred to the master. Such an assistant produces a picture for the master in the same sense as a literary man produces a book for a publisher.

Applications of photography to science have been made, and we may mention the successful work done by Messrs. C. Ray Woods and Lawrance in connection with the solar eclipse; and also the extensive use made of photographic records at the Saltpetriere Hospital in Paris by M. Charcot.

The New Patent Law (see page 725 of our last vol.) is now in operation, and it is to be hoped that much benefit will result from the increased facilities now offered to inventors. Some six or seven new societies have been formed, and the number of photographic amateurs has considerably increased, and we have not to record very

severe losses through death. Among those who are no more we may mentiou:—Mr. Pearsall, who was associated with Brande and Faraday; Mr. John Beattie; Mr. J. Lessels, the late president of the Edinburgh Society; Mr. Colin Sinclair; and Mr. A. G. Pettit, of Keswick, whose death was recorded in our last number.

LIGHTNING PHOTOGRAPHED.

WE have already spoken of Herr Robert Haensel's successful series of lightning photographs; today we are able to place before our readers one of his pictures. Herr Haensel, so our contemporary *La Nature* tells us, is a skilful photographer residing at Reichemberg in Bohemia, and his lightning pictures were taken on the 6th July last, between ten o'clock in the evening and midnight.

Wheatstone, who has measured the duration of a flash of lightning, says that it occupies but the millionth part of a second, and although to the human eye the effect appears far longer, this is due simply to persistence of vision. The gelatino-bromide plate, however, only receives an exposure of this brief duration, and it says much for the sensitiveness of modern films, to find that these are able to produce a picture in so short a time. The print we publish is a photo-etching from a photo-gravure made from the original plate by M. Gillot of Paris, so that the result is in all respects a pure photograph, and has not been touched by hand.

Herr Haensel, to secure his photographs, simply set up his camera in the dark night, with slide drawn and shutter open. Ten exposures were made, and four very good negatives secured. As far as he could judge by setting up his apparatus next morning, and observing the same objects as were included in his views of the previous night, Herr Haensel considered the flashes to be some 1,700 metres distant—about a mile, therefore—at the time he photographed them.

As our readers are well aware, photographs of lightning flashes have been obtained in this country, but the series of Herr Haensel is, we think, the most perfect yet secured.

ON THE QUANTITY OF AMMONIA USED IN THE AMMONIA EMULSION METHOD.

DR. EDER was the first, or one of the first, to give definite quantities for the manufacture of gelatine emulsion, ammonia being used to gain sensitiveness. He gave from time to time much information on the subject, and amongst other statements of his there is one to the effect that the quantity of ammonia required to cause sensitiveness is not proportionate to the silver salt held in suspension by the gelatine, but is proportionate to the quantity of water which is used; that, in other words, there is not required, when a certain amount of nitrate of silver is employed, a certain corresponding quantity of ammonia, but that it is necessary to have a certain percentage of ammonia in the emulsion which is being rendered sensitive, so that, the quantity of silver salt remaining the same, we have to increase the quantity of ammonia if we use more dilute solutions.

Our experience confirms this, or even somewhat more than confirms it, inasmuch as we find that, if sensitiveness is to be gained in the same length of time, we require rather a larger percentage of ammonia with weak solutions than with strong. To take a definite example: when using 100 grains of silver nitrate to form an emulsion, we may use any quantity of water from about two to four ounces. In the latter case, we will have to add somewhat more than double as much ammonia as in the first.

It is curious that there has been little or no discussion as to what is the maximum amount of ammonia which may be added to an emulsion without producing fog.

The original formula of Dr. Eder gave the quantity to be added as from three to five per cent., the strength of the ammonia being such that the specific gravity is ·88. He also gave, as the temperature at which stewing was to be performed, from 90° to 100° Fahr.

It has been our experience, and we think will have been that of most other experimenters, that with such a quantity of ammonia, and employing such a temperature, no reasonable time of stewing would give a very sensitive emulsion.

We found that, stewing for half-an-hour, which was what Dr. Eder recommended, we got a sensitiveness of perhaps a fifth or a sixth that of an average commercial plate; that is to say, a sensitiveness which would be represented by 10° or 12° of Warnerke's sensitometer. By longer stewing we got greater sensitiveness, even up to that of a good commercial plate, or about 17° or 18° sensitometer, but we found ourselves in difficulties with the gelatine, which lost its powers of setting after being kept ten or twelve hours at the temperatures mentioned in the presence of three to five per cent. of ammonia. This difficulty could of course be got over by using only a part of the gelatine at first, and adding the remainder just before putting the emulsion on one side to set for washing. We prefer, however, to employ means whereby we can gain rapidity without the long-continued stewing which we have mentioned.

Some time ago we described certain experiments in which we had used much higher temperatures than those usually recommended when ammonia enters into the composition of the unwashed emulsion. We at that time adhered to the percentage of ammonia recommended by Dr. Eder, but increased the temperature. At 160° Fah. we got emulsion as rapid as anything which we had ever handled, and plates which gave fine dense negatives.

We have since tried the effect of keeping the temperature down, and of adding larger quantities of ammonia. We have been somewhat surprised to find how a large quantity can be added without producing fog. We find no tendency to fog even with ten per cent. of ammonia, and somewhat concentrated solutions, the temperature of stewing being 100° Fah., and the length of time thirty minutes.

To make our statement more definite, we give the exact quantities experimented with :—

No. 1.

Silver nitrate	200 grains
Water	2 ounces

No. 2.

Bromide of potassium	160 grains
Iodide of potassium	10 ,,
Nelson's No. 2 gelatine	50 ,,
Water	2 ounces

No. 3.

Hard gelatine (soaked in water) 100 grains

No. 4.

Ammonia ·88 ... ... 1 ounce

No. 5.

Hard gelatine (soaked in water) 100 grains

The emulsification is performed at a high temperature th Nos. 1 and 2. No. 3 is then added, and the tempera- re either raised or lowered as is necessary to bring it to 0° Fahr. No. 3 is then added, and the temperature is ain raised to 100° Fahr. It is kept so for half-an-hour, e solution being constantly stirred. At the end of that ne No. 5 is added. There will probably be just enough at left in the emulsion to melt it ; if not, a little warmth ist be applied, but in any case as little as possible ; and soon as the gelatine is melted, the emulsion must be oled as rapidly as possible.

The reason why the whole of the gelatine is not recom- nded to be added at first is that if it were, the action the ammonia would so far reduce its setting powers at there would be no getting it into a condition fit for shing. Indeed, there is liability, even when the half the gelatine is added only at the last, to want of stiff- ss, the large quantity of ammonia used robbing the gela- e of much of its setting property. Here the use of bromate of potash will be found to give a good result. We would recommend the use of bichromate with any ulsion, as it undoubtedly reduces the chances of fog, l does not in our experience reduce the sensitiveness of emulsion. Two grains may be added to each ounce of ulsion immediately after the sensitizing process, either boiling or by the use of ammonia, is gone through. It l be found that a somewhat stiffer jelly results in its sence than without it. It is, of course, necessary to sh the emulsion somewhat longer than if no bichro- te be used, but not for the excessive lengths of time ich we have heard stated. We find an emulsion in ich there is bichromate to have reached its maximum sensitiveness after half an hour's washing, if it be finely ided.

The formula which we have given will be found to give ery sensitive emulsion, and plates which give great sity.

UTILIZING SCRAP GOLD.

HERE are not a few photographers who are sufficiently erprising to prepare their own chloride of gold, though manner which the powers that be do not approve of, rely, by dissolving up a gold coin. This is an offence the eyes of the law ; but an ingenious gentleman has gested to us that the little difficulty may be surmounted procuring the coin of some other realm, say of France America, from a money-changer, who will only demand rifling premium for the accommodation. We merely eat the hint, and leave the reader to take it for what it y be worth ; but for the present only wish to throw out ggestion as to how small and comparatively valueless s and ends containing gold may be put to some use by photographer. There are, probably, few families where e piece of broken jewellery is not occasionally laid aside as not being worth the expense of being repaired, and such trifles are often allowed to accumulate in some convenient toilet receptacle, as, in spite of the gold they contain, the sum that would be offered for them by a goldsmith would be almost nominal. In a family boasting a disciple of photography, these scraps may, with but little trouble or knowledge of chemical manipulations, be put to some use by extracting the precious metal and converting it into chloride.

The gold used for ornamental purposes ordinarily contains from twenty-five to seventy-five per cent. of the precious metal, the other metals alloyed with it being silver and copper, or, more frequently, both of them ; but very many articles which are regarded by their owners as gold, consist of a mere shell or casing of the precious metal, the interior being filled in or weighted with lead. Even when the proportion of copper in the alloy is high, we have not found that its presence interferes in any way with the efficiency of the gold chloride as a toning agent for silver prints ; still, cases may arise in which it is desirable to obtain the chloride of gold free from copper, and we will briefly indicate such means as are most suitable for the photographer.

On a commercial scale, gold of very low quality is often boiled with strong sulphuric acid as a means of removing a considerable proportion of the copper and silver, but this method is by no means to be recommended to the photographer, as boiling sulphuric acid is a dangerous agent for an amateur chemist to meddle with, and an attempt to part low gold by the sulphuric acid method might lead to a serious accident if a test-tube or small glass flask were used. A suitable platinum pan is not often to be found in the photographer's chemical corner.

In accordance with the more usual *aqua regia* method, a mixture of three parts of strong hydrochloric acid to one part of strong nitric acid is taken, and the flask containing the alloy and the acid is gently warmed till the metal is completely dissolved, great care being taken that the liquid does not boil, as otherwise the free chlorine, which is the active agent in dissolving the gold, would be driven off. If great care be exercised in regulating the heat, it will suffice to use as much of the mixed acids or *aqua regia* as is equal to four or five times the weight of the metal to be dissolved ; but we recommend eight or nine times the weight in ordinary cases. The silver is of course converted into chloride, but as this is soluble in strong hydrochloric acid to a very considerable extent, the solution is diluted with water, and the chloride of silver filtered out, but the chloride of copper remains in solution. The solution is then evaporated down in a porcelain dish till nearly all the free acid has been separated. A little water is then added, and evaporation continued. The mixed chlorides are then dissolved in about twenty times their weight of water, and as much powdered oxalic acid as the liquor will dissolve is stirred in, a small excess of the oxalic acid doing no harm. After this, the solution is allowed to stand for forty-eight hours, by which time all the gold will be precipitated, and may now be collected on a filter and washed with boiling water to remove soluble materials.

Nothing remains to be done now but to convert the gold into chloride. This is best accomplished by placing it in a glass flask, and dissolving it in eight or nine times its weight of *aqua regia* (that is to say, a mixture of one part of nitric acid and three parts of hydrochloric), but, as in the previous case, care must be taken not to boil the mixed acids. When all the gold is dissolved, the solution is poured into a porcelain capsule, and evaporated on the water bath until acid fumes are no longer evolved. Water is now added to the extent of one drachm for each half grain of (pure) gold dissolved ; and this solution will be found about equal in strength to that made by dissolving commercial chloride of gold in water in the proportion of one grain to the dram.

Though these little operations take some time to describe, they give really very little trouble in the performance, and only require the ordinary amount of care which the photographer has to give to most of his work. Too much trouble is perhaps involved to render the working up of scrap gold a method to be generally employed in the preparation of the chloride, but it will be found useful, and certainly economical, to thus utilize any odds and ends that may be lying about. The amateur, especially, who likes to make things for himself, may derive much satisfaction from making his own chloride.

PHOTOGRAPHIC ENGRAVING.

IN our previous article on the subject of Photographic Engraving, some of the parent processes were passed in review, notably that of Fox Talbot, who was the first to produce a photo-engraved plate fit for publication. Although Talbot's process was confined to the production of copper and steel plates, yet it proved available for the purposes of periodical illustration, prints having appeared in the pages of the PHOTOGRAPHIC NEWS in 1858 and 1859. For all that, the claims of Paul Pretsch as an original and successful investigator in this branch of photography must not be overlooked, as it is to his labours that we are, in a great measure, indebted for the production of commercial printing blocks that can be employed with letterpress in book illustrations.

Pretsch discovered—by taking advantage of the twofold properties of a bichromated film of gelatine, viz., its becoming insoluble under the action of light, and of the portions unaffected by light retaining an affinity for water—that a cast in high relief could be obtained.

M. Poitevin, an engineer, even at an earlier date than Talbot or Pretsch, laboured in the same field. He was engaged in 1842 in attempting to produce photo-engravings on the basis of Daguerreotype plates. After the picture had been developed with the fumes of mercury, and before it was fixed, the plate was connected with the negative pole of an electric battery, and placed in an electric bath. Copper was only deposited on the parts not protected by the coating of silver iodide, and the plate was subsequently fixed, and the silver laid bare where it had been protected by its coating of silver iodide. The copper was then oxidised by heat, and treated with mercury, which attacked the silver. It was next coated with gold leaf, the gold amalgamating with the mercury, the plate being afterwards etched with nitric acid, the acid attacking the plate wherever it was unprotected by the amalgam.

This process, however, came to no practical issue, and the illustrious pioneer was constrained to turn his attention to photo-lithography, in which his experiments were crowned by a greater measure of success. He coated a lithographic stone with bichromated albumen, and after allowing the mixture to dry spontaneously, by the action of light the albumen became insoluble and resisted water. A stone so coated and exposed under a negative united readily with fatty ink, while the parts unaltered by light had an affinity for water. Potevin's process was brought to wonderful perfection in the hands of M. Lemercier.

M. Baldus appears, as an independent worker, in 1854, to have produced some notable examples of photographic engraving on copper plate by the use of chromic salt and gelatine, thus following in the footsteps of Talbot; while M. Garnier, in 1855, proceeding in the line of research instituted by Poitevin, exposed a brass plate to the vapours of iodine, printed it under a negative, and after exposure treated it with mercury, which amalgamated with the part unaltered by light. The subsequent steps are marked by originality in so far as he unfolds a new property in the repellent action of the mercury when treated with printing ink. When an inked roller was passed over the plate, the ink adhered only to the parts unaffected by mercury.

DR. GORE'S RESEARCHES ON THE REDUCTION OF METALLIC COMPOUNDS BY VARIOUS GASES AND VAPOURS.

THE most important photographic methods are founded upon the easy reducibility of metallic compounds: their reductions being ordinarily effected by the joint action of light, and a reducing agent, the presence of light serving to determine the reaction. Although the reduction of silver compounds is the main feature of very many photographic reactions, it is not necessary to seek far for instances in which other metals undergo either complete or partial reduction. Ferric salts are reduced to the ferrous condition in Pellet's cyanotype method, and also in the platinotype process, while the partial reduction of chromates in the presence of organic matter is the fundamental principle of carbon printing and most photo-mechanical methods.

Dr. George Gore, of Birmingham, has recently published details of experiments which show how energetic are the reducing properties of certain gases or vapours which are frequently present in a vitiated atmosphere. His experiments with coal gas, and with the products of its combustion, are especially interesting, as they elucidate the well-known fact that such gaseous products frequently cause insolubility of carbon tissue, or other forms of bichromated gelatine; and that they cause many of the irregular surface reductions met with on sensitive surfaces containing silver salts is extremely probable. Mr. Gore says:—

1. A mixture of dry and pure carbonic oxide and carbonic anhydride gases, passed in a stream slowly through various liquids, had the following effects:—A solution of bichloride of palladium was rapidly decolourised, and all its metal precipitated as a black powder. One of tetrachloride of platinum was slowly decomposed, and yielded a small amount of yellow precipitate in two or three days.

3. By passing carbonic oxide during two days through a solution of potassic cyanide, with a rod of bright magnesium half immersed in it, the liquid became brown, and the metal was coated with a blackish film in the liquid. Magnesium alone in a similar solution did not turn the liquid brown in three days.

4. A dilute solution of bichloride of palladium exposed to a mixture of hydrogen and carbonic anhydride (or to pure hydrogen alone) had the whole of its palladium precipitated in the metallic state in a period of twenty-four hours.

5. An atmosphere of coal-gas was maintained in contact with the following dilute liquids, each of which had a vertical platinum wire partly immersed in it. The liquids were in open bottles in a dark place. Dilute solution of palladic chloride:—Rapid reduction to the state of metal as a film upon the surface of the liquid in four hours; the solution became colourless in a few days; some of the metal was also precipitated as a black powder, and some as an adhering bulky lump on the end of the wire. With dilute terchloride of gold, in the course of a few days, beautiful films of metal, bright, and of exceeding thinness, were produced upon the surface of the solution. Much gold was also deposited on the bottom end of the wire. The films formed successively and sank. The liquid was not wholly decomposed in three weeks. Solid crystals of auric-chloride were gradually reduced to metal. Solution of platinic chloride was only slightly decomposed in ten weeks. With a solution of argentic nitrate:—Signs of decomposition occurred in a few hours. In fourteen days a deposit of metal had formed on the sides of the glass bottle; but the whole of the silver was not deposited in seven weeks.

6. The gaseous products (containing acetylene) of a blown down and smoky flame of a Bunsen burner were collected over water and passed through various liquids. They rapidly decomposed a solution of palladic chloride, and less quickly one of terchloride of gold; a solution of platinic chloride was slightly affected, and one of chloride of iridium and potassium remained unaltered.

The films of gold and palladium formed upon the surface of a liquid by contact of a gas, or between two liquids at their dividing line by a non-miscible solution, might prove of service in some physical experiments.

It is worthy of consideration whether the reduction of metals to the native state in the interior of the earth may not in some cases have been effected by contact of their solutions with liquid or gaseous hydrocarbons derived from coal and other mineral substances of organic origin.

THE NEW PATENT LAW.

A FEW days before the expiration of the old year, the Board of Trade gave notice that all fresh applications would be dated for January 1st, and be treated under the new law; but whether they really intended to act up to this, or only wished to prevent applications being made during the last few days, it is impossible to say. At any rate, things went on as usual at the Patent Office till the end of the year, except that during the last day or so there was a slight increase in the number of applications for provisional protection, doubtless from persons who were afraid of being forestalled in the rush of specifications expected on New Year's day.

In visiting the Patent Office on Wednesday, we were surprised to find a record of only 262 applications on the first day of the year, but among these there were three of direct interest to the photographer — Hart, cameras; Van der Weyde, vignetting photographs; and Morgan, picture mounts. The first patent of the whole series (No. 1) is that of Mr. Johnstone, for an apparatus to divide dough into loaves, while Mr. Hart's patent is numbered 8, and Mr. W. E. Debenham comes in as No. 10, with an improvement in electric-lamps emitting light in a vacuum.

By-the-Bye.

GOOD SITTERS.

PERHAPS we ought rather to have written "Good Customers" at the head of our article, for as it stands the title scarcely expresses our meaning. In fact, the more we look at the heading, the less we like it; readers outside the photographic world may take it we are about to speak of the incubating virtues of certain domestic fowl, while those who continually hover about the posing chair will naturally believe it is the docility and amiability of sitters who do as they are told, we are going to admire and enlarge upon. So that our heading is really a very bad one, and if it were not too late for the printer to make an alteration, we should ask him to do it.

Still, with all its faults, the title may serve as well as any other to the few random words we have to say about photographers and their good sitters and customers. Defined by many, the client who falls under this denomination is he who does not ask for a re-sitting, who makes no fuss, and gives orders for several dozen of his carte, with one or two painted enlargements to follow. This, we take it, is what photographers are apt to term a good sitter, and what they generally look for. It is the good sitter, of all others, most studios desire to secure; whether the means taken to attract and to ensure the sitter being a good one are successful, the photographer alone can tell.

For it is no use shutting one's eyes to this fact; that there are among the photographic community many who have done their best to spoil good sitters. No calling or profession exists that has not its black sheep, and we shall have the sympathy of every righteous brother, when we say that half the troubles photographers suffer from are due to the unscrupulous dealings of those who hang on to the skirts of the profession. Fortunately, with every day that passes, photography is taking a higher standing, and the public are beginning to find out that it is not everybody who blackens his fingers with chemicals that can make a picture, even if he can take a photograph. Still the public have generally a very absurd notion of the price of first-class photographs—due in a great measure to former experiences—and the consequence is they are often disinclined to pay reasonable prices, simply because they believe these are uncalled for, and, therefore, extortionate.

In proof of this, ask any gentleman or lady outside the ken of photography what he or she presumes to be the salary of a first-class artist in the studio? Take any one of the first half-dozen establishments in town, where the principal himself does not occupy himself with posing, and enquire what pay these gentlemen demand and receive. The answer will most certainly be very much below the actual fact. Your friend would stare indeed if you mentioned such sums as three, four, or five hundred a year as the salary of a capable artist-photographer, and yet these salaries are given not only in the best establishments in town, but in the provinces, too. Or, again, putting the highest class of assistant on one side for a moment, ask what income the principal who acts for himself, not as a business man, but as an artist-photographer, would consider an equivalent for the services which have gained for him a high reputation. We make bold to say that no due consideration is ever given by outsiders to this point, who would perhaps be surprised to hear that such authorities as the late Adam-Salomon, Fritz Luckardt, H. P. Robinson, &c., to name a few of the élite, expect as comfortable an income as the thriving painter, barrister, doctor, or other professional man.

It is thoughtlessness on this head, combined, as we have said, with a mistaken notion that anyone with black fingers can dabble in the black art, that robs the photographer of many a good sitter. But it is only one of the reasons, and we merely touch upon it first as it is the great natural difficulty the photographer has to get over. But he must not lay the flattering unction to his soul that therefore the matter is out of his hands; that if he gets a good sitter, he may praise Allah, and that if he does not, the fates are against him. Where prejudice on the part of the public robs him of one good sitter, his own shortcomings rob him of half-a-dozen. In fact, so far as our experience as one of the public goes—and it is not insignificant—we would say it is, generally speaking, the photographer himself who makes a sitter good or the reverse. Even when a customer enters with mistaken notions as to the capacity of photography and photographers, it is often in the power of a good photographer to make a good sitter of the visitor. But this is no doubt a delicate and difficult task; what is neither difficult nor delicate is to keep a good sitter when you have got him, and this many photographers fail to do most singularly.

We are ready with chapter and verse to prove our case, so we trust the reader will hear us to the end. Here is instance No. 1. Not a twelvemonth ago, a lady was introduced to us, and one of her first questions was as to a studio we could recommend for a portrait. The lady was not fair, but dark; she was handsome, with good bearing, and a fine figure. You cannot go wrong in the matter of advice, if you never give any, is a good maxim to act upon in these circumstances; but as the lady found we would give no positive opinion, she asked for a negative one. Did we think Mr. Tripod's a good studio? she asked, for she had seen some charming pictures of Miss Esther Vane in the shop windows; she had indeed almost made up her mind, but she would so like somebody else's idea on the subject.

Our opinion was briefly that it was a very good studio, and the lady in consequence visited it under a double recommendation. That is to say, there was every reason why she should be pleased; she paid a fee of a guinea and a-half without murmur or dissent, and there was, in a word, the making of a good sitter out of her. And what was the result? The proof submitted was that of a plate underexposed in every corner, and taken altogether in the most slovenly fashion. It is true a few lines came with it, stating that if the picture were considered unsatisfactory, the firm would readily give a re-sitting; but that meant the sitter's former trouble was all thrown away, and that

the careful dressing up in finery and the apportionment of another morning were all to be done over again. Could not some one have taken the trouble to inspect that negative; or was the customer estimated at low value, since she paid her money promptly, and did not give a West End address? From a brief account we received of her visit, the most scant attention seemed to have been bestowed upon her.

This was a London experience Here is one from the provinces, from a studio established in one of our fashionable resorts. A gentleman, a military man, brought us a little brown vignette of his better half. "Here, look at this; I know you will give me a true opinion—what do you think of it?" We did not say what we thought of it then, but we will now; the paper was yellow, and the features and hair were unsharp everywhere. You could almost make out a double eye-brow on the left side of the face, and there were double hairs all over the forehead. Yet that picture had been paid for handsomely, and my acquaintance told me he had looked forward to visiting Summertown, in order to visit this well-known studio. Out of curiosity, we made it our business to enquire afterwards about these two particular pictures, and we may add that in both cases an assistant had done the work; still, this fact, obviously, does not take the responsibility off the shoulders of the principal.

But these, will say some of our readers, are isolated and unfortunate cases that may happen occasionally in the most carefully-conducted studio. We cannot agree with them; on the contrary, the head and front of the offending is the discipline of the studio. When it is first opened, and when the actions of all come up to those good intentions, which they say are to be found elsewhere than in the studio, everything goes well and satisfactorily. But if followed by a relaxation of discipline, whether this has to do with the appointments of the studio or its personnel, then, from that moment, you begin to turn good sitters into bad ones. Directly you commence to judge this sitter or that, to show this one a certain amount of attention, and that one less—in short, as soon as you begin to make a distinction between them in treatment—you run the risk of losing many a good sitter. You set yourself up to judge, and as often as not you judge wrong. To treat all studiously alike with the same strict precision and consideration is the only wise plan, and the only way of ensuring good sitters.

If any further proof were wanting, we have but to point to the "Half-a-dozen Portraits" of which we spoke last year. In these cases, it will be remembered, we maintained the secret of our visit so closely that in not one studio were we recognized. And what were the results of our experience. That although we passed as a good sitter, as one who was easily satisfied, and who paid without murmur what was asked, in three instances, at any rate, out of six, we were dissatisfied. Thinking and acting as one of the public, we should never repay a second visit to three of the studios, for the simple reason that we did not receive due attention; we should try our fortune elsewhere. From this, it would almost seem that half of our studios do not deserve to have good sitters. In any case, this is clear to our mind—that good sitters may often be made by the photographer himself, and if they fail him, the fault lies more with the studio than with the sitter.

Next week, our "By-the-Bye" will be on "Bad Sitters."

PERMANENCE OF PHOTOGRAPHIC PRINTS.

BY JOHN G. HORSEY.

On the 28th of November, twenty years ago, I was employing my leisure exactly as I am to-day, producing photographic prints, but not prints from negatives obtained by the easy dry plate process of to-day, nor under quite such convenient circumstances as we are accustomed to here in London. Then (November 28th, 1863) I resided a short distance from the city of Sydney in Australia, surrounded by sandhills which, in this particular month of the year, are always extremely hot and unpleasant, and render it necessary, when working near them, to hasten the collodion plate through the process of exposure to development. Except from rain, we were entirely dependent for our supply of water on a well about two hundred yards from our cottage. What I required I had to draw and carry, and as this was hard and warm work, especially in summer, I did not waste much over washing prints.

A great deal has been written about the impossibility of producing permanent prints on albumenized paper. My object in contributing these few lines is to prove the contrary, if twenty years is sufficient lapse of time to do so, and I think it is. At the time I speak of I produced prints from whole-plate negatives on paper prepared by myself. After toning, I carried them direct to the fixing bath, there to remain for twenty minutes, then gave five changes of water, allowing half-an-hour between each, finishing off with hot water for a few minutes only, and then dried them.

One of the prints then so treated (I put the date on it at the time), after lying in a drawer for about ten years, has since for a similar period been hanging framed in my bedroom, and is as clear and perfect as on the day I produced it. Others of same batch have been kept between the leaves of books, and are equally perfect and unchanged. May we not from these facts congratulate ourselves that our beautiful prints are not so evanescent as many of my fellow scribblers would have us believe? I think so.

A Dictionary of Photography.

ALBUMENIZED PAPER (Printing on).—*Continued.*

Fixing.—This operation consists in dissolving away the redundant silver chloride, and bringing the print into such a condition that it may be freely exposed to a strong light without being injured. The most suitable agent we are acquainted with for dissolving the silver chloride, and the one universally employed for the purpose, is sodium thiosulphate ($Na_2S_2O_3$), known among photographers as "hypo." This salt, though a most valuable photographic agent, may do serious injury to the photographer should it be allowed to mingle with other materials used. To be forewarned is to be forearmed; therefore the student will be most careful not to spill any about the floor, to be afterwards kicked up in the form of dust; neither must he drop a portion into any other solution, nor wipe his hands on the towel while fixing, without having previously washed them. Innumerable failures may be traced to a little laxity in the above respects.

The quantity of solution to be made up must be determined by the amount of work in hand. Small batches consisting of only a couple of dozen prints of small size can be fixed in a pint of solution; but for quantities of ten or fifteen sheets, a bath containing at least three gallons should be used. We recommend the fixing solution to be prepared some time previously, and it will be well to perform this and the operation of fixing the prints in a separate apartment. The proportion of crystal to water should be about 1 to 5. When small quantities are employed, it is usual to make it fresh every day, and slightly alkaline by means of ammonia, thus preventing the liberation of sulphurous acid, the presence of which would inevitably cause the prints to fade. After the bath has been used once for prints, it need not be thrown away because it is inexpensive; it will answer quite as well for fixing gelatino-bromide films as if freshly-prepared, and should be eventually treated with liver of sulphur to recover the silver.

Opinions differ regarding the use of a fixing solution more than once—and, as we have pointed out, for small quantities, once only should be the rule. When large quantities of, say, four or five gallons are used to fix as many hundred prints, the solution may be employed at least three successive days, provided it be strengthened each day, and kept slightly alkaline.

To make a small quantity, dissolve sodium thiosulphate 4 ounces, in warm water 20 ounces. When cold add ammonic

hydrate, 5 minims. A wide-mouthed bottle will he a useful vessel to keep for this quantity of bath.

Pour the fixing solution into a deep flat dish, having the toned and washed prints in a vessel of water near at hand; transfer the prints, one by one, from the vessel of water to the fixing bath in the following manner. With the right hand withdraw a print from the water, dropping it into the fixing solution. With the left hand press it face downwards, continuing the operation until all the prints are added. Let the vessel used for washing be put in its place before the right hand be allowed to touch the fixing solution. By a strict observance of this rule, another cause of failure is removed. If many prints are to be treated it is better for one person to drop the prints into the solution, while another separates them.

It is quite as important to agitate the prints during fixation as when toning, otherwise stains, and eventually yellow patches, will result. To prevent such an occurrence, keep turning the prints one by one face upwards; next turn them all face downwards, and continue turning them for the space of fifteen minutes from the time the last print was added from the washing water.

The prints, if treated as we have described, will be thoroughly fixed, and, if examined by transmitted light, will appear clear in the white portions. Collect the prints in bulk, drain off the superfluous liquid as much as possible, and separate them in a vessel of clean water. At least four changes of water should now be given, separating the prints each time. They should be next placed separately on a sheet of plate glass, or a flat porcelain dish, and pressed with a sponge to remove as much of the water from them as possible, after which they may be put in the washing apparatus.

Washing Appliances.—Photographers are more divided in opinion as to which is really the best mode of washing their prints after fixing, than might be expected; each one avers his method to be correct both in principle and practice. Doubtless this arises in some measure through individual circumstances, among them being water supply, quantity of work, and inventive capacity. To mention the scores of contrivances we have seen would be more likely to confuse than to teach; therefore we will mention two only to illustrate rapid and slow washing respectively. The first of these is Mr. Marshall Wane's rapid cylindrical washer, described in "Studios of Europe," pp. 189-190, and shown in fig. 1. The outside cylinder, A, is simply a casing of tin to keep in the water; the inside cylinder, B,

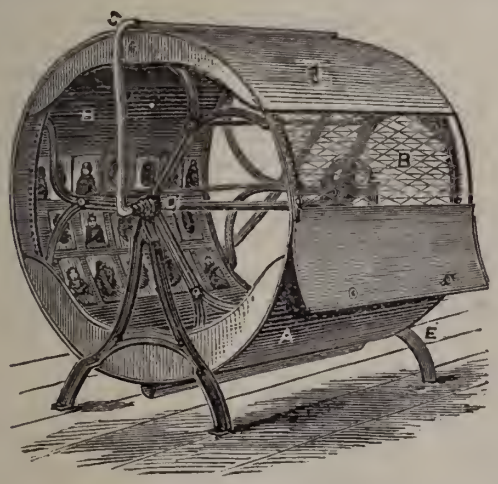


Fig. 1.

that revolves, is a few inches smaller than the exterior one, and it is simply a frame-work covered with twine netting. The prints are laid on this netting in the act of washing, the water being supplied by small holes pierced in tubes passing through the drum. Prints washed by means of this arrangement for twenty minutes, after the previous treatment of four changes of water and pressing with the sponge, are not found to contain any trace of the fixing salt.

The other apparatus is a simple and effective arrangement intended for slower washing and larger quantities. We believe it is manufactured by Doulton and Co., Lambeth, from the design of Mr. W. Pitcher (fig. 2). A, water supply. B, zinc cover to fit over C, perforated with fine holes, to allow the water to stream all over the surface of the prints. C, deep glazed earthenware vessel for the reception of the prints, a number of fine holes being made in the bottom for the water to pass through. D, outer vessel, of the same material, fitted with syphon (S), to permit the wash-water being removed from the bottom at regular intervals, dependant upon the rate of supply. Three or four hours' washing with such an arrangement will be found ample for the removal of the last traces of the salts retained in the pores of the paper after fixation. That is more than can be said of the custom of soaking prints a dozen or more hours in water, with one

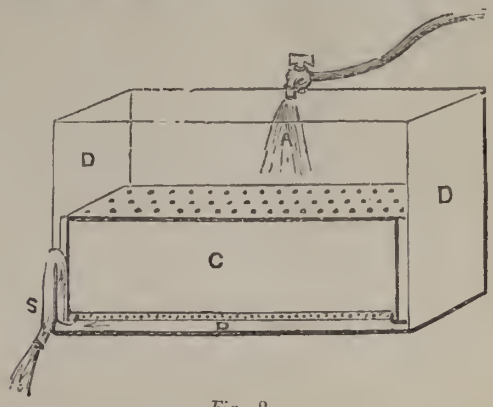


Fig. 2.

or two changes at the commencement, and as many at the finish of the soaking.

FRENCH CORRESPONDENCE.

PHOTO-TYPOGRAPHY—PHOTOGRAPHIC COPYRIGHT QUESTION—CALICO DISHES AND FUNNELS—CELLULOID VARNISH FOR GELATINE NEGATIVES.

Photo-typography.—The question relating to the transformation of a negative or positive print, having soft gradations of shadow, into a typographic negative with hatched or stippled shading, is becoming more important every day; yet it is surprising to see how little used are the processes producing this transformation. For example, we have been in the habit lately of receiving with the NEWS very fine impressions by the "Ink-photo" process of Messrs. Sprague and Co. To reproduce these lithographic impressions as typographic negatives requires only that one of these prints be reduced, using the negative thus obtained for an impression on bitumenized zinc. The result, when bitten with acid, would be a remarkable typographic negative. Finding that none has availed himself of the application of this process, I have undertaken—as a demonstration only—to reproduce one of these prints, of which the typograph will be published in my treatise on photo-typography, now in the press. By a careful examination under a magnifying glass, it will be seen that these prints realise all the requisite conditions for giving typographic images. A network of fine black lines, clearly separated by white spaces without any continuous half-tint, will be observed. The custom of interposing striated or granulated pellicles between the negative and sensitive film causes a hazy half-tint over the white spaces, and a far more complete result is obtainable from images similar to those by the "ink-photo" or Woodbury films previously inked. The interposing of an artificial network should therefore be abandoned unless in exceptional cases. If a regular grain over the high lights is desired in certain parts of a typographic negative, the bitumen image having been printed from the negative and developed, the engraving plate is re-coated with bitumen, and exposed under a network, and again developed. It is easier, perhaps, after the first exposure, to trace with fatty ink the desired network on the plate, and afterwards let it bite with acid as usual.

Photographic Copyright.—The question of copyright of

photographic works is following its course at the Senate A commission has been appointed to study M. Bardoux's bill. The point is whether our legislative body, after considering photographic copyright equal with that of works of art in general in most international commercial treaties, will contradict this course by depriving photographic works in France of protection. The Photographic Society of France and the Syndicate are both taking active measures to avoid such an undesirable state of affairs.

Calico Dishes and Funnels.—I have lately been studying the possibility of diminishing as much as possible the tourist's photographic baggage, by making calico dishes and funnels. Strong, well-made stuff is cut into pieces of the desired shapes, and coated with normal collodion; afterwards varnished with celluloid in a warm place, the stuff being about 30° or 35° Cent. Dishes, &c., may thus be carried in the pocket, and used for developing, fixing, and washing of plates or pellicles. Pellicles without paper or collodion as support are much more easy of manipulation.

Celluloid Varnish.—Celluloid varnish is excellent for gelatine negatives, but difficult to spread evenly. This substance is proof against water and other agents, with the exception of alcohol, ether, and acetic acid. Still, the protection of the negative is rendered more complete than with any other varnish. LEON VIDAL.

Notes.

The International Exhibition at the Crystal Palace is announced to open on April 23rd. There has been some doubt expressed whether photography will find a place under its roof, but as the exhibition is advertised as "Universal," and is to contain sections for art, science, and industry, photographs and photographic appliances must perforce be admitted.

We are very diffident about the wisdom of printing Herr Haensel's photograph of lightning, which appears in our columns this week; it is so unlike any picture, painter or draughtsman has ever produced. The orthodox zigzag is entirely wanting, and there is not a single sharp angle throughout. In fact, the photograph, with its gentle curves, is the very reverse of what our artists always put before us.

The Meisenbach process—the method by which our portrait of Sarah Bernhardt was produced—is surely, if slowly, making way. The best of the German comic papers, *Fliegende Blätter*, last week contained a very good specimen, the original being a pencil or crayon sketch, and not a pen-and-ink drawing, like those usually chosen for reproduction by "process."

Captain Abney, in the *Bulletin Belge*, says that the Platinotype Company's intensifying solution contains chloride of potassium and mercuric chloride dissolved in water.

The first number of *Le Progrès Photographique*, edited by M. Leon Wulff, has just appeared.

It is said that the "Sunshine Recorder" at Kew had a holiday during Christmas week. Seemingly, this "Recorder" has been doing nothing ever since.

Dr. Liesegang claims to have issued no less than eleven editions of his handy little book on carbon printing; the last issue of *Kohle Druck*, which reaches us with the date of 1884 printed on its title page, will no doubt be received with the same favour as its predecessors.

By the way, we see that, according to Dr. Liesegang, the first photographic business established was that of Professors J. W. Draper and Morse, in America, who began work in 1839, the same year as Daguerre announced his discovery.

It is more than a dozen years since Mr. Spiller called the attention of the Photographic Society to a white ivory-like material called Xylonite, manufactured from gun-cotton, camphor, castor oil, and a suitable pigment. We ourselves, at the time, made experiment with the material in the form of thin plates, for developing carbon prints, its white and pliable nature giving hopes of successful employment for this purpose. But we found the surface was not sufficiently like enamel, being waxy and liable to scratch. For knife-handles, pianoforte keys, and billiard balls, the material has, however, found a wide application.

In Paris they evidently use billiard balls of this description, for at a café on the Boulevard Poissonière, says the *Globe*, "as two persons were playing the other evening, two of the balls, after coming into contact rather sharply, ignited and not only destroyed themselves, but also set fire to the cloth of the table." The proprietor, naturally indignant, threatens to bring an action against the manufacturer of the balls, and with this view has sent sundry fragments of them to be analysed. If the balls are made of soluble guncotton, this will be easily discovered by the chemist, and the fact that such balls are liable to ignite by cannoning will be a bar to the further use of this material in connection with billiards.

We seem to have made a serious mistake the other day in describing M. Chapiro of St. Petersburgh as "Court Photographer." It should have been "By special appointment to the Academy of Fine Arts." Daily papers, please copy.

The nomination of candidates to fill vacancies in the Council of the Photographic Society must be made during the present month. There is an impression abroad that he who receives most nominations is usually elected, and that a candidate well "requisitioned" is almost certain of success. No doubt popular candidates have an advantage, but we should be sorry to see the day that electioneering traits are introduced among the members of the Pall Mall Society.

A correspondent announces in the *Times* the discovery of two inscriptions of King Nebuchadnezzar on Lebanon. The inscriptions are engraved on rock, right and left of a pathway, and although their translation has already been made by M. Pognon, a clever Assyriologist, the *Times* cor-

respondent says: "It is very desirable that at least photographs of them should be executed, and mouldings taken before the originals, already so seriously injured and exposed to the vandalism of the natives, have suffered new and irretrievable harm." Pleasure-seekers are, it appears, one of the scourges of Syria, and as these Arabs will do anything to get money, such a discovery as this is never safe. To photograph it is a kind of assurance against loss, and, therefore, its reproduction in this wise should be undertaken without delay. The inscriptions, it seems, which are headed by the titles of Nebuchadnezzar, relate to the felling of cedar trees in the neighbourhood of Lebanon.

"The old curiosity shop" of Charles Dickens, where lived in fancy, if not in fact, little Nell and her grandfather, is doomed. To many people, a memento of the quaint old pile that inspired Dickens to write his touching story would be very welcome, and the best memento would undoubtedly be a good photograph. The house is No. 14, Portsmouth Street, Lincoln's Inn Fields, and is said to be the last house in the parish of St. Giles-in-the-Fields. For some time, the old premises—they are now used as a store for waste paper—have been in a shaky condition, and on Boxing Day steps were taken to have the building shored up.

It is gratifying to learn that the fourteen observing parties stationed around the North Pole, of whom we have several times spoken in these columns, have been able to fulfil their duties successfully, and return home without mishap. The stations were chosen by Professor Wild, the President of the International Polar Committee, and most of the European nations, as well as the United States, sent representatives. The time allotted for the observations was a twelvemonth, and they were carried on simultaneously at all the stations, viz., from August 1882, to August 1883. Besides meteological and magnetical instruments, most of the parties were provided with photographic apparatus, of which very good use seems to have been made.

Truth employs a new phrase in criticism; instead of repeating Hamlet's oft-quoted dictum about out-heroding Herod, our contemporary speaks of a bigger and intenser nature, as a photographic enlargement of the character.

An object of considerable interest to photographers is announced for sale next Thursday, among the effects of the late Mr. J. J. Bennett, F.R.S, at Sandrock, Maresfield. This is no other than "the original invention of Heliographie by Mons. Nicephore Niépce, with his autograph memoir." This manuscript would be of considerable value in any historical collection, and we sincerely hope it will find a sympathetic purchaser. The auctioneers entrusted with the sale are Messrs. Austen and Son, of Marling Place, Wadhurst.

There has always been an objection to awarding medals to portraits pure and simple. How can any judge decide upon the work of a portrait, unless he knows the original? while its contributor, on the other hand, if he sends a fancy portrait or figure study, may run the risk of being put out of the portrait class, and relegated to the "genre" collection, which, strange to say, usually commands but an inferior award. A model for the best type of beauty would at once clear away doubts of this kind, and any costume, however fanciful, and pose, however romantic, would be admissible. Indeed, the competition would be an incentive to strive after something outside the conventional.

No doubt much would depend upon the model chosen, but this is a matter as important almost to the painter as it would be to the photographer. The obtaining of a charming model is of itself a display of taste, for it is not every damsel, however comely, who satisfies artistic exigencies. Again, while this lady's oval face and olive complexion would serve well as a "Maid of Athens" if she were draped, say, as "Ophelia," the result, despite the model's beauty, would be probably a failure; and in the same way, obviously, a "Hetty Sorrel" or "Dolly Varden" could not pose as Cleopatra. Here at once is plenty of artistic scope for the photographer. Next come pose and expression; and last, but not least, the lighting, all of which would give competitors plenty to do. In the end, possibly, it might be that the judges inclined to one type of beauty rather than another, but this must remain one of the elements of chance, to be found in every competition.

Though Mr. Pancoat's remarks at the Photographic Society on photographers who exhibit pictures from negatives which they have neither prepared nor developed excited a murmur of response from the meeting, it by no means follows that there is nothing to be said on the other side of the question. That which governs excellence in photographs now-a-days is, to use a somewhat hackneyed phrase, their artistic merit. Superb manipulative photography is quite out of count if the subject be ill-chosen or ill-arranged. Time was when photographic excellence alone was sufficient, but that was before we had become masters of our materials. In many first-class studios the photographer—or, as he should be called, the artist—does not trouble himself about the development, but concentrates his whole attention on the posing and lighting of the figure, to the manifest advantage of the picture. Where it is a matter of out-door photography, development, however, is in many respects like the laying on of colours in painting; judgment, skill, and tact are all necessary.

The great point to insist upon is that the picture shall really be the result of care and study, and not a mere "fluke." It is quite possible for a man quite ignorant of the rudiments of artistic composition to obtain by chance a most charming picture; but for every one so obtained he will show with equal pride twenty abortions. Mr. Pancoast probably alluded to such, and if so, everyone will agree with him, that photographic societies ought not to be overrun with new members whose only photographic

qualification is that of being able to uncap the lens. A recent test to secure only good men would be, previous to election, the submission of (say) a dozen pictures, which, if uniformly good artistically, would show that they had not been secured by stray shots.

Apropos, it may be no breach of confidence to point out that at a competition held not long since, an award was decided on this very ground. Between two series of photographs very nearly equal in merit, the choice fell on the series which showed the most uniform compliance with the canons of art. The unsuccessful photographer, though he had produced some beautiful pictures, had made mistakes in others, which clearly indicated that his results were not altogether dissociated from accident.

Patent Intelligence.

Applications for Provisional Protection.

5896. ALEXANDER BORLAND, of Wilmslow, in the county of Chester, for an invention of "Improvements in and apparatus for the production of photographic negatives to be used in the processes of photo-lithography, photo-zincography, photo-engraving, photo-etching, or photo-type productions.—Dated 28th December, 1883.

New Patent Law, 1884.

8. HART, "Photographic cameras," known as portable folding or tourists' cameras.

114. VAN DE WEYDE, "Producing vignetted photographs."

175. W. MORGAN, "Production of picture and other like mounts."

Grant of Provisional Protection.

5681. WILLIAM ROBERT LAKE, of the firm of Haseltine, Lake, and Co., Patent Agents, Southampton Buildings, London, for an invention of "Improvements in and relating to colour-printing, also partly applicable for producing coloured photographs and for similar purposes."—A communication to him from abroad by Auguste Bisson, of Paris, France, Heliographic Engraver.—Dated 8th December, 1883.

Patent Sealed.

4732. JOHN EDWIN ATKINSON, of Greenwich, in the county of Kent, for an invention of "Improvements in apparatus for use in transporting and exposing sensitized photographic plates or films."—Dated 4th October, 1883.

Specifications Published during the Week.

2316. BENJAMIN JOSEPH BARNARD MILLS, of the firm of Harris and Mills, of 23, Southampton Buildings, in the County of Middlesex, Patent Agent, for "A new mode of and apparatus for packing and preserving sensitive plates."—A communication to him from abroad by Antoine Lumière, of Rue St. Victor, Monplaisir, Lyons, in the Republic of France.—Dated the 7th of May, 1883.—(*This Invention received Provisional Protection only.*)

The invention consists of a metallic box intended to contain previously prepared dry plates for photographic purposes, and to preserve them from all exterior action of light, of humidity, or of any other agent which could injure them. The height of the box is a little less than that of the plates which it is to contain, these latter are held therein in parallel grooves formed of a corrugated sheet soldered to the lateral walls, which are thus strengthened. The four vertical faces are also strengthened by projecting ribs of various forms. The cover is provided with a shoulder parallel to its edges, which limits its application to the box in such a manner as to cover without touching the upper edges of the plates which project above the box. The plates are thus held perfectly without contact, and can be easily placed and withdrawn by their upper edge. All sides composing the cover of the box are carefully soldered by the overlapping of one of them over each edge in such manner as to render the whole perfectly tight. The closing is effected by a sealing with cement, with sealing-wax, or any other material preventing the entry of light, covered, if required, with a band of cloth or paper.

2323. JOSIAH ADAMS the younger, of Liverpool, in the county of Lancaster, for "Improvements in the manufacture of coloured photographic pictures."—(*This Invention received Provisional Protection only*).

My plan of operation is to place the photographic image on the back of the plate, then paint its outer surface either after varnishing or otherwise. When the paint is dry, coat the entire back with a mixture of oxide of zinc, gum, and balsam, or oxide of zinc and a drying oil. In place of oxide of zinc, the sulphide of zinc may be used, if the colours used do not chemically decompose it, or other suitable chemically neutral pigment could be used with either of these menstrua. While the gum, which can be gum copal, gum elemi, or other like transparent gum, is still wet, a sheet of pure white cellulose paper is laid on in such a manner as to avoid the enclosing of air-bubbles, and gently pressed against the photograph, so that the menstruum in which the oxide of zinc or other pigment is suspended shall penetrate the pores of the paper, and he thus, by capillary attraction, withdrawn from the surface of the photograph. The paper is allowed to dry on the plate, and as evapouration goes on on the outer surface of the paper, still more of the menstruum is withdrawn from the surface of the plate. The result is, when the whole has set, a clear, closely-adhering coat envelops the surface of the plate, and an effect almost if not quite equal to opal glass is obtained. Instead of pure cellulose paper, other bibulous material could be substituted, but it must be absorbent, not brittle, and absolutely neutral chemically. The bibulous matter in some instances can be done away with altogether. Thus, if a varnish menstruum be used, it can be laid on thick, and before setting, the outer surface repeatedly but gently washed with ether. The ether, having a strong attraction for the menstruum, rapidly draws it from the surface of the plate, leaving the pigment against the latter. The result, however, is not as good, as it is liable to scratch or rub off, and is but a poor and expensive substitute for the process already described.

Patent Granted in France.

154,972. SCHLOTTERHOSS, for "An automatic apparatus for exposing flexible and elastic bodies to the action of solar rays and other agents."—Dated 19th April, 1883.—Class 12.

155,104. TOMMASI, of Paris, for "A photo-electric selenium-regulator."—Dated 25th April, 1883.—Class 12.

Patents Granted in America.

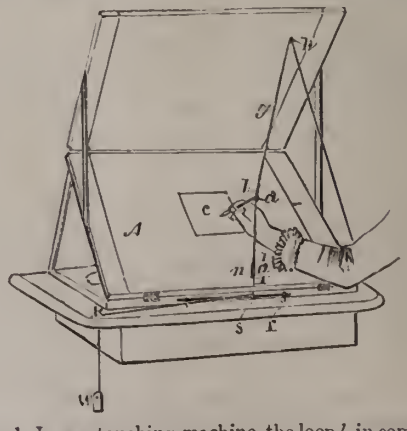
Issued December 11th.

289,951. W. IRVING ADAMS, Mont Clair, New York, "Photographic developing pan or tray." Filed Aug. 1883. No model.

A glass bath with a well at one end, like the well-known "Burton bath."

Issued December 18th.

290,217. JAY DENSMORE, Niles, Mich., "Machine for retouching photographic negatives."—Filed August 29, 1883. (No model).



Claim.—1. In a retouching-machine, the loop *l*, in combination with the pencil *d* and the cord or string *g*, substantially as described.

2. In a retouching machine, the elastic section *a* in the cord or string *g*, in combination with a retouching-pencil, substantially as described.

3. In a retouching-machine, the combination and arrangement, with the cord or string *g*, of the bar *b*, the eye *h*, the loop *l*, the eye *n*, the ring *s*, the rod *r*, and the weight *w*, substantially as described.

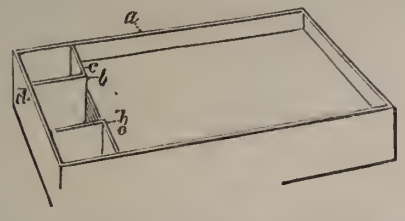
290,655. Charles L. Wright, New York, N.Y., "Process of colouring photographs."—Filed April 18, 1883. (No specimens.)

Claim.—1. The process of making coloured photographs, substantially as herein described, which consists in applying to photographic paper in a raw state an even coating of a mixture of egg-albumen, neutral sulphate of barium, chloride of ammonium, salicylic acid, and glycerine, then sensitizing, printing, toning, and fixing in the ordinary manner, and then softening the albumen coagulated in the preparation of the paper with concentrated ammonia, then applying the colours in a mixture of albumen, salicylic acid, glycerine, aqua-ammonia, and water, and then setting the colour in the prints by passing them through a bath of alcohol, water, and nitric acid, in or about the proportions as set forth.

2. The process of preparing photographic paper to receive the impression from the negative, substantially as herein described, which consists in applying to the paper an even coating of a mixture of egg-albumen, neutral sulphate of barium, chloride of ammonium, salicylic acid, and glycerine, in or about the proportions as set forth.

3. The process of colouring photographic prints, which consists in applying the colours in a mixture of albumen, salicylic acid, glycerine, aqua-ammonia, and water, and then passing the coloured prints through a setting-bath of alcohol, water, and nitric acid, in or about the proportions as set forth.

290,587. Edward Klauber, Louisville, Ky., 'Box for Photographic Dry-Plates."—Filed June 11th, 1883. (No model).



Claim.—A dry-plate box having near one end the rectangular abutments *b*, with their edges *c* truly vertical and in line with each other, and between the abutments the interspace or recess *d*, which is a little larger than the thumb, and sits out sufficiently from the adjacent end wall of the box to allow the introduction of the thumb for removing the dry-plates, substantially as specified.

CHAPTERS ON LANDSCAPE.

No. 1.—In the Field.

BY H. P. ROBINSON.

I am afraid that in these chapters a great deal more will be found concerning my own personality and productions than a modest writer would willingly admit; but I cannot see my way out of the difficulty, and for fear the reader should find the individuality offensively prominent, I apologise beforehand and hope to be forgiven.

The nature of the information I wish to convey, and the lessons I desire to inculcate, seem almost to demand that I should teach the results of my own experience, and to suggest that the pictures which have been the outcome of that experience would be the most suitable illustrations. It ought to be evident that pictures which have been actually produced by photography will better show the peculiarities and limitations of the art than any other method of illustration. At the same time, the lessons to be learnt from the great masters of painting and the allied arts are not to be neglected: indeed, without some knowledge of the laws which govern the arrangement of a picture so that the greatest amount of pictorial effect shall be got out of any given material, the student is scarcely ready to take the field. For our present purpose, however, we will suppose the pupil has some slight inkling of this knowledge, and is, to some extent, acquainted with the laws of Composition and Chiaroscuro.

Before you go out with the camera in your hand, it would be well to decide what you intend to do. A camera, if of any size, is but an encumbrance the first time you inspect an unknown district in search of subjects. A note-book and pencil are much more appropriate implements, and a view-meter may be useful, but the camera is best left at home. Of course, I know that when you are hurried, as on a tour, you have no time to make these preliminary arrangements; but, under such circumstances, you are not so much looking after pictures, as endeavouring to secure reminiscences of your travels, in the nature, as it were, of sketches. Our present object is to make pictures. Equipped, then, with note-book and pencil, you may go forth prospecting.

When you meet with a scene that strikes you as giving unusually fine opportunities for obtaining a good picture, don't throw it away by making a careless use of it, such as taking it at the wrong time of day, or without the necessary figures and accessories to make all out of it that can be made. Don't leave the arrangement of it until you want to expose the plate. Think it all out thoroughly before the time of action comes, so that you may have nothing else to do than to execute when the moment arrives—when the weather is propitious and all things are conducive to a successful result. Waste your time and plates as much as you like, but don't throw away a fine subject. Besides being the nearest road to success, it is a saving of time to "think before you leap."

As an illustration of how time may be saved by preliminary inspection, I may state that in addition to walking several miles, I once exposed thirty 15 by 12 plates in nine hours. These were all landscapes with figures—each, more or less, telling a story. A few of the plates were used for duplicate exposures, so as to make more sure of difficult or favourite subjects; but twenty-two of the resulting pictures have since appeared in exhibitions, and some have taken medals, so their quality must have been up to a certain mark. This rapidity is easily accounted for. We were staying at a country house, and had been troubled with unsuitable weather for eight or ten days, and had little else to do but look out subjects and make a complete study of them. So the work was all cut and dried when the fitting day arrived. And what a day it was! It was worth waiting for. The light seemed to alter to suit every effect I desired. A slight sketch was made for each picture, and the subject and title decided, the models selected, and the exact place and pose assigned to each figure. There was nothing left to be done, speaking metaphorically, but to turn the handle and grind out the tune.

When a view is selected, you should consider it as a painter would if he were going to make an important work of it. You have not so much power of modification as he possesses, therefore your skill and ingenuity must make up for the loss. In most cases there is more to be done than some photographers are aware. The chiaroscuro is very considerably in the photographer's hands. It is proverbial that everything will come to him who knows how to wait; and if he is not hurried—and I am not writing for the American tourist—he can select from twenty different effects of light,—from the long shadows of early morning, through the almost shadowless noon, to the softened lights and deepened shades of coming evening.

The composition, also, is capable of great modification Variations of a foot or two in the point of view will often very materially alter the arrangement of the lines and masses. The removal of the limb of a tree or less obtrusive twigs and branches, will sometimes disclose a picture which scarcely existed before. The opening of a gate may serve to give variety of line and opportunity for figures that did not previously exist. I have even seen the floodgates of a weir opened, so that a photographer might obtain the effect he required. When all has been done that can be done, take yet another look round to see that nothing has been forgotten. Above all, don't trust to your memory

for anything. Make sketches and notes, so that nothing may be left to chance; you will then be free in your mind to proceed with the selection of your next subject.

As there are no two things alike in nature, no two blades of grass, nor even two accurately corresponding sides of the same face, it is difficult for me to be very particular and minute about the arrangement of any special view or views, and what I have to say will consist a good deal in negative advice. I can, however, refer slightly to some subjects that have not yet been much hackneyed or made the common property of every photographer, like the ruins of our castles and abbeys, our churches and waterfalls. This, by-the-bye, reminds me that I did not notice any representation of Conway Castle in the last exhibition of the Photographic Society. We miss our old friend. The venerable ruin has never been absent any previous year. Kenilworth and Warwick, however, were still to the fore.

Enough use has not been made of the sky. We sometimes see a photograph of a good sky with a bit of sea—witness Mayland's splendid "Sea and Cloud," and the use of a second negative in ordinary landscapes has fortunately become common, notwithstanding the opposition the method met with for several years—but we seldom see what might be called a sky picture; that is, a picture the principal subject of which is the sky, the land and figures taking a secondary position. Here is a slight sketch of the kind of effect I mean.

The peculiar charm of aerial phenomena is too much neglected. The clear, bright day, when all objects are sharply defined, is still the sort of weather in which the photographer delights. There are lovely pictures to be got in the mist, but the opportunities for these effects are rare. Some years ago I rose very early each day for a week in the attempt to get a group or two of mushroom gatherers in the morning mist. But "The breezy call of incense-breathing morn" was wasted, and I was not rewarded for my constancy. Who has not seen and admired the beautiful, dreamy, indefinite effect of mist among the nearly leafless trees of autumn, when the sun, trying to pierce through the vapour-laden atmosphere, has reproduced a scene from fairy-land?

Such a scene as this I saw a day or two ago. I was out with a shooting party, and was one of what is called the "forward guns." I was waiting at the end of a beautiful cover. A fine mist partly obscured everything, but so slightly that the strong sunlight penetrated and illuminated the foreground, which consisted chiefly of a light, broken clay bank that gave great breadth, and threw back the mist-enveloped trees. A keeper in dark brown velveteen, with a black retriever at heel, listening to the beaters working their way from the far side of the wood, added life to the scene, and gave point to the composition. It was a quite possible subject. I was forgetting all about the shooting when a dead pheasant plunged at my feet and awoke me from my dream.

In the selection of a view, great attention should be paid to the foreground. The foreground is of so much importance that I do not hesitate to say that if a view is not well-fitted in this respect, it can never be an effective picture. An uninteresting plain of smooth meadow, for instance, is sufficient to ruin a view, however beautiful the middle distance and distance may be. A landscape photograph seems to require a good foreground more than any other kind of picture. Other parts of the scene must compose well, and be in harmony, but it is not necessary that they shall be of importance, while if the foreground be weak or ill-composed, no strength or importance in other parts will save the picture.

It is fortunate, however, that the foreground is just that part of the scene over which the artist has most control. It would be useless to go into any detail as to the arrangements of foregrounds; the disposition of each can only be settled as each case arises, but I here give an illustration of how one of the most uninteresting foreground has been ameliorated by the introduction of figures.

In this case there was a pretty, varied belt of trees in the middle distance, and a wooded height in the distance; the foreground was a plain piece of park-land, with useful clumps of gorse and braken scattered about, but a photograph of this would have no claim to be a picture. The simple introduction of a couple of figures with some little action in them breaks up the plainness of the field, gives interest, and accentuates the composition.

The student having now made up his mind what he is going to do, may go and do it. He should see that his mechanical arrangements are so complete and easily accessible that he will scarcely have any necessity to think of them; but for fear he should have to do so, let him put his hands in his pockets and get an assistant to look after the luggage, for it is not easy to arrive on the ground capable of good work if you have been doing duty as a heavy porter on the way. All preliminaries should be so complete that no doubt or hesitation should be possible. The battle should be fought and the victory won before the cap is taken off the lens, or the trigger of the shutter is pulled.

(To be continued.)

CASEIN EMULSION.

BY JOHN BARTLETT.

THE following experiment, though resulting in nothing of practical importance, may have its value in the suggestion it offers.

From the relation which casein bears to gelatine, albumen, and the other members of that group of bodies known to the chemist as the protein compounds, I was induced to try it as a vehicle for the sensitive salts of silver; more by way of curiosity than with any expectation of receiving good results. Never

theless, the comparativo success which attended my experiments, although conducted in rather a hap hazard manner, has induced me to make known the facts.

Casein as it occurs in its ordinary state of solution in milk, has certain properties which are entirely different from those possessed by cascin obtained perfectly free from alkali.

To obtain it in the latter condition, ordinary skim milk is taken and freed as much as possible from every trace of cream, and then coagulated by a few drops of acetic acid. The coagulum or cheese thus formed is pressed in a flannel cloth to free it from the whey; it is then dissolved in a dilute solution of carbonate of soda (sal soda), from which it is again precipitated by hydrochloric acid, the precipitate collected and thoroughly and repeatedly washed in a flannel bag with water containing two per cent. of hydrochloric acid; the object of the washing is to free the cascin from fat. It is then mixed with pure water, in which it swells and gradually dissolves, especially if the temperature be slightly raised.

The casein in a pure condition may be thrown down by careful neutralization with an alkali, and the precipitate washed.

So formed, casein dissolves only slightly in cold water, rather better in hot water, but not at all in alcohol. It forms solutions with carbonate and phosphate of soda which no longer exhibit an alkaline reaction. It dissolves very readily in chloride of ammonium, nitrate of potassa, and other neutral alkaline salts, forming on evaporation a film of horny cascin. It dissolves in dilute mineral acids, but is precipitated on addition of excess of acid. The solution in hydrochloric acid, as we have said, dissolves readily in water, but before doing so swells up like gelatine. It was this property which confirmed my notion of its probable use as a substitute for gelatine.

I accordingly made use only of this combination of casein with hydrochloric acid without experimenting with the pure casein, the properties of which I have merely quoted to direct the attention of those who may desire to experiment further.

I tried several combinations, using the bromides of zinc, cadmium, and ammonium; making the emulsions by the cold and by the hot method.

I found that a precipitation of the cascin invariably occurred on adding the nitrate of silver; but by the cautious addition of pure ammonia and subsequent gentle boiling, a complete solution was effected, and a rather fine-grained emulsion produced, which, when poured warm upon the plate, flowed tolerably well, and hardened in about twelve hours. The plates produced were sensitive to the light, giving impressions in fifteen seconds.

But I do not consider the rapidity of the plates of any value in my experiments, knowing that by proper use of the chemicals any degree of sensitiveness may be obtained—my object being merely to show the possibility of the employment of casein as a vehicle for sensitisation. As far as my knowledge extends, I have not heard any mention made of its use, and, therefore, hope that these few and imperfect essays may have their value in stimulating some one possessed of more knowledge and experience.—*Philadelphia Photographer.*

Correspondence.

PHOTOGRAPHIC BLOCK METHODS.

DEAR SIR,—Now that so much is being said about priority in successful photo-typography, I must insist upon the recognition of a fact which appears not to be generally known outside of this country. It is this: the "Ives' Process" is the first patented or published process which was introduced into truly successful commercial operation. I see that this claim is now made for the process of Meisenbach. Meisenbach's original specification dates nearly four years later than my own, and nearly one year later than my U. S. patent on that form of the process which is now in use. Moreover, my process was in successful commercial operation here some months before the patent was issued, and has turned out hundreds of plates every year since.

A southern trade journal (published semi-monthly) commenced the publication of a series of Ives' process portraits in January, 1883, which appeared regularly for more than six months, and still continue to appear at irregular intervals. This is undoubtedly the first series of photo-typographic portraits which ever appeared in a regular periodical publication, printed in a page of type matter.

A great many other Ives' process plates have been used in illustrating newspapers and magazines in various parts of the country, and we have letters which prove that they have usually given unqualified satisfaction.—Respectfully yours,

Philadelphia, December 8th, 1883. FRED. E. IVES.

GREENISH-YELLOW LIGHT IN THE DARK-ROOM.

DEAR SIR,—It may interest your readers to know that I am still using the green light, and would be very sorry to be obliged to use any other; but why photographers go on with the ruby light I cannot understand, as I found it most injurious to my eyesight.

I am glad to see Mr. Debenham's experiments confirm my views as expressed on page 764 of your volume for 1882; but does he use it in his dark-room? I think if the dry plate makers used it they would find a great advantage in being able to see better.—Believe me, yours truly,

W. S. BRADSHAW.

[Mr. Bradshaw recommends (*loc. cit.*) one thickness of ground glass, one of green, and one of deep orange.—ED. P. N.]

THE HYDROKINONE DEVELOPER.

SIR,—I should be glad to have the experience of some of your practical contributors as to development with hydrokinone. I have used it according to Mr. Pocklington's formula, and I have succeeded well when a full exposure has been given; but with instantaneous work, the image almost disappears in the hypo bath (full strength). Though I shall try all I see in the NEWS on the subject, I think the experiences of the photographic fraternity will be acceptable to many of your readers, myself included.—Yours truly, G. ST. JOHN BIGGS.

BRISTOL INTERNATIONAL EXHIBITION.—AWARD IN CLASS IX.

DEAR SIR,—Permit me to send you the following resolution passed by the Council of the Association, with regard to the above award. For the clearer information of those interested, I may say that the regulation for Class IX. reads thus:—"A silver medal for the best enlargement of any subject, and by any process, *provided it be the work of the exhibitor.*"

Mr. W. F. Donkin inadvertently omitted to state that the enlargement exhibited by him was not his work, when sending his exhibits, the result being that a difficulty now arises, and with much regret the Council feel that the least unsatisfactory course is the one they have adopted.—Yours faithfully, H. A. HOOD DANIEL, *Hon. Sec.*

Resolution.—"That in consequence of Mr. W. F. Donkin having disclaimed the medal awarded to him in Class IX., *the enlargement in question not being his own work, but that of the Autotype Company*, and the conditions of exhibition in this class thereby not having been complied with, the Council, with reluctance, feel compelled to retain the medal."

INSTANTANEOUS PHOTOGRAPHY IN NEW YORK.

SIR,—On receipt of your much esteemed journal of November 30th, it stated that instantaneous photographs in America appear to be somewhat a novelty. The *Illustrated World* of New York, thinking it worthy of remark that a photographer should be successful in obtaining photographs of views of interest in and about the city, and that at the opening of the Brooklyn Bridge, photographs were taken with absolute fidelity, the exposure of the plates being so brief that the vibration caused by the machinery of the steam tug in which the camera stood

had no perceptible effect on the pictures. "Such photographs, the PHOTOGRAPHIC NEWS says, in England are of everyday occurrence."

Allow me to say, that instantaneous photographs have been taken in and about New York years before the bridge was completed. Enclosed I send you three instantaneous pictures which speak for themselves. One was taken by the writer in the fall of 1880, from the West Street steam ferry boat, and you can see the road-way of the bridge was just commenced. The others were taken down the bay in the Spring of 1881, from a small cat boat, and if there is any kind of craft that has more motion, in a sea way, than that description of boat, I don't know it.

Three-fourths of our instantaneous negatives are made by amateurs, and the bromo-gelatine plates were used by them at least two years before the professional photographers introduced them into their galleries. Now, in 1883, when they occasionally make instantaneous views, they think that they are doing something very wonderful for the profession.

The fact is that, with us, portraiture is the only branch that pays, and neither pains nor expense are spared by the professional to make it a success.

Landscape photography, and all out-of-door work, is almost unknown to them, if we are to judge by the few pictures for sale in the stores.

The amateur photographers on this side of the water would be very reluctant to let the amateurs of England suppose that they have never derived any benefit from the many valuable articles which have been contributed to the photographic journa's by the English amateurs, and found their way over here, much to our enlightenment. It is true we are few in number, but we hope to see the day when we will be many. We have difficulties to encounter of which you have no conception; even the standing of an amateur is not with us as with you; the very acceptation of the word with the press means a beginner or novice, and a man that will work for the love of the work, and nothing more, is only fit for a lunatic asylum.

There are numbers of doctors who never get a call, of brokers that never make a sale, of lawyers who never have a case in court, men of ample means, but who have to make a pretence of business because it is respectable to do so, and who no doubt would find photography a more pleasing occupation if they could brave public opinion.

Please accept my excuse for offering this explanation, which has overflowed its limits, and believe me to be, yours truly, LEWIS ATKINSON.

[Mr. Atkinson's note is accompanied by some delightful little sea sketches taken by photography.—ED. P.N.]

PHOTOGRAPHIC SOCIETY OF IRELAND.

SIR,—In the report of the Society's meeting, and of the paper read at that meeting on the 14th December, 1883, by an error, the name of Mr. McGhie was substituted for Mr. J. H. Halvey. Will you kindly, in justice to Mr. J. H. Halvey, make this correction?—Yours faithfully,

CHARLES W. WATSON, *Assistant Hon. Secretary.*

[A notification to the same effect appeared in our columns last week.—ED. P.N.]

PHOTOGRAPHIC ILLUSTRATIONS OF DICKENS' WORKS.

DEAR SIR,—Reading your YEAR-BOOK for 1884, what you say on page 141 in reference to a society or an association to take negatives of places referred to by Dickens struck me as being a very good idea, and I should think could be managed by a few amateurs who liked to take it up. It only wants some one to start it, I am sure, to be a success, and so I write to you to ask you to kindly publish this in your paper, so that any amateurs who may like to take it up can write to me, and then we can see if we are able to get up an association for that purpose. If you would publish what you say in the YEAR-BOOK with this letter, it would give your readers an idea of what is wanted. Letters can be addressed to me at the subjoined address, or at my house, "Oak Villa," Beulah Hill, Upper Norwood, S.E.—Yours truly, A. R. DRESSER.

2, *Park Terrace, Bognor.*

[We shall be happy to give any assistance in our power towards the furtherance of the scheme. Our readers can themselves refer to the YEAR-BOOK, page 141.—ED. P.N.]

Proceedings of Societies.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

A CONVERSAZIONE under the auspices of the Association was held in the Victoria Hall, Glasgow, on the evening of Tuesday, the 18th inst. Councillor ROBERTSON, president of the Association, occupied the chair, and in a few opening remarks expressed his pleasure at seeing so many members and friends gathered together, and hoped they would spend a happy evening.

The chief feature of the conversazione was the exhibition of photographic and philosophical apparatus, tastefully arranged on tables in the centre of the hall, which was beautifully illuminated by the incandescent lamps of the Edison and Swan electric light Co.'s. The lights, which were encased in delicately coloured globes, and arranged in festoons, had a very fine appearance, reflecting great credit on Mr. Grant, manager of the company.

Mr. SMELLIE, of the National Telephone Co., had fitted up sets of telephones and telegraphs. These instruments were very much appreciated, and messages were flashed from one end of the hall to the other the whole evening, one wire doing duty for both instruments. An electric pen and several other articles were exhibited by the same gentleman.

Mr. WHITE, optician, sent an attractive contribution, including graphoscopes, revolving stereoscopes, a fine set of Geisler's tubes, a galvanic battery, &c.

Messrs. MARION, of London, amongst other things, showed an Enjalbert camera, Cowan's changing box, and an Academy camera, which received a great deal of attention.

The local dealers were represented by Messrs. Mason and Co., McGhie and Bolton, and Kelso and Co., who had all well-filled tables, showing the finest apparatus and the latest novelties of the season.

Mr. MACTEAR lent a grimo-kistoscope, an instrument invented for the use of caricaturists. It is somewhat in the form of a stereoscope; its lenses are, however, made to revolve by clockwork, and a portrait inserted into it undergoes many mirth provoking transformations.

A few specimens of work were also exhibited. Walter Macfarlane, Esq., showed some of Mr. Vernon Heath's large Autotypes, which were very fine; Messrs. Goodall and Stevens exhibited some very good specimens of their bromo-argentic enlargements on opal and canvas; and Messrs. Annan had a large photo-engraving of Sir Noel Paton's "Fairy Raid"; while Messrs. Maclure and Macdonald showed some magnificent specimens of Lichtdruck printing. Passing on from these signs of profession, we come to some exhibits which may be regarded as almost antiquarian.

The PRESIDENT exhibited a complete list of Daguerreotype apparatus.

Mr. ABBOTT, of Dundee, sent some specimens illustrating the early stages of photography, including a lens made by himself about forty years ago.

Mr. CHURCH showed the first pneumatic plate-holder, made about 1852.

A volume of Calotypes in the possession of Mr. Thos. Annan, taken and printed about the year 1844 by the late D. O. Hill, R.S.A., showed very little signs of fading. Having been taken in direct sunlight, they have a pictorial breadth sadly wanting in the smoothly touched-up portraits of the present day.

The meeting was enlivened by a considerable display of amateur talent in music, song, and recitation, and altogether a very pleasant evening was spent. The meeting terminated with votes of thanks to the exhibitors, committee, and chairman.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 27th ult., Mr. A. COWAN in the chair.

Mr. W. M. Ashman, with a view of testing whether mercuric iodide solution acted as an accelerator when added to a sodic developer, exposed three plates in a very dull light on the previous day, and developed as follows:—

No. 1. Exposure five seconds:—

Pyro	2 grains
KBr	2 „
Ammonia ·880	2 drops
Water	1 ounce

No. 2. Exposure, five seconds:—

Pyro	2 grains
KBr	2 „
Saturated solution of washing soda ...	1 ounce
Mercuric iodide solution	3 drops

No. 3. Exposure, twenty-five seconds:—

Pyro	2 grains
KBr	2 „
Saturated solution washing soda ...	1 ounce

It had been claimed that exposures can be reduced four-fifths by this means. He (Mr. Ashman) could not corroborate this. No. 2 would be seen to possess more detail than No. 1, each having received one-fifth the exposure of No. 3.

Mr. W. Cole said a saturated solution of soda would be a stronger alkali than the ammonia and water used in No. 1.

Mr. W. E. Debenham thought if the ammonia plate had been developed longer, or received one half the quantity of soluble bromide, it would have produced the same result; or if the plate had been developed with as much ammonia as it would bear, it would have been quicker.

The Chairman enquired whether the mercuric iodide was dissolved in excess of iodide or excess of mercuric chloride; he considered the difference in the manner of mixiug material to the result.

Mr. Ashman said he used a slight excess of potassium iodide.

Mr. A. L. Henderson considered the gain was due to the intensifying action of the mercury; he did not think it was generally known that no restrainer was required with sodic developers. Glycerine and colloid substances generally were all restrainers; he had obtained the best results with 5 mimims of a 30-grain solution of caustic potash.

Mr. F. W. Hart suggested the use of pure carbonate of soda; he saw no advantage in using common soda, which contained sulphate and other impurities.

Mr. Debenham enquired how long the plates were in the developing solutions.

Mr. Ashman replied that No. 1, being sufficiently dense, was removed from the developer at the end of three and a-half minutes; Nos. 2 and 3 required seven minutes to obtain sufficient density.

After some further discussiou on the properties of mercury with iodide, in which the Chairman, Messrs. Henderson, Hart, Tunny, Debenham, Ashman, and others took part,

The Chairman suggested that Mr. Ashman should expose equally two more plates, developing one with sal. soda, and the other with sal. soda and an additiou of mercuric iodide.

Mr. Henderson said on the last occasion Mr. Starnes lent his lamp to him to try a few experiments; he exposed a fairly-rapid dry plate in four divisions close to the lamp for 30, 60, 90, and 120 seconds, and a wet plate in three divisions 5, 10, and 15 minutes respectively. In each case there was a deposit; but after intensifying and clearing the wet plate, the five minutes' exposed portion disappeared, leaving a very good indication in the other two. He had since tested one of Mr. Starnes' plates in the sensitometer, and obtained 9. If Mr. Warnerke considers 10 on his sensitometer a good speed for a wet plate, the slowness of Mr. Starnes' plate would account for the discrepancy in their experiments. Mr. Starnes, acting on the suggestions offered at the last meeting, has altered his lamp. The back is matt, and the front glazed with cathedral green; a plate exposed to this light at a distance of 15 inches for 1, 2, and 3 minutes respectively, turned round, and exposed 10 and 20 seconds, was not acted upon, there being light enough to coat plates three yards from the lamp.

Mr. Starnes exposed four plates up to 15 minutes at a distance of 27 inches; no effect was visible.

Mr. Debenham enquired if Mr. Henderson did not find the combination of green and yellow gave more light than ruby.

Mr. Henderson had not made many experiments, but he preferred canary medium to anything he had met with up to the present, this being a greenish yellow.

Mr. Cole asked for informatiou on the best means of restoring a faded silver print.

Mr. Henderson said there was several ways: one would be to wash out all the starch, soak it in iodine followed with platinum, thus converting the image into the latter metal, and washing thoroughly afterwards; another plan would be to bleach the image with bichloride of mercury followed with lime water, not ammonia or hypo, which would probably dissolve it entirely. Some time ago he brought an old print up by means of acid pyro; in any case a good wet plate negative should first be taken.

Mr. J. G. Tunny promised to send some examples of paper negatives for examination recently shown before the members of the Edinburgh Photographic Society.

It was announced that the proceedings will commence punctually at eight o'clock on lecture nights, when all who may be interested in the subject are invited to attend. The next lecturette will be given on January 10th, on "Printing."

Talk in the Studio.

Large Woodburytype Moulds by the Stannotype Process.—We understaud that some especially large moulds have recently been made in a perfectly satisfactory manner, in the laboratories of Messrs. Woodbury, Treadaway, and Co., at South Norwood, the subjects being beyond the power of the hydraulic presses available in this country. Our readers are aware that moulds have been made by the roller press, but we have never seen one in which that truth of surface which is necessary for the production of a really good print was secured; and in the case we refer to, we understand that the Stannotye process was only adopted after repeated attempts had been made to obtain good results by the roller method (see Photographic News 1883, p. 660).

A Method of Photometry.—We read in a Continental journal of Dr. H. Hammerl and his very ingenious method of reducing the intensity of a light for photo-metrical comparison, by cutting off one-half, three-fourths, or even nineteen-twentieths of the light, so that what remains is easily measured. It consists in placing in the path of the rays that fall upou the screen a revolving metallic disc from which are cut sectors that allow a portion of the light to pass through, but cut off and absorb the remainder. If the sum of the angles of all the sectors taken together equal 180°, one-half of the light will be intercepted, while the other half passes through. Experiments show that three sectors will suffice to give an uniform illumination with a moderate speed of revolutiou. The size of these sectors will, of course, depeud upon the amount of light to be cut off. When it is desired to reduce the light to one-third, each sector must have an angle of 40°. If each sector has au angle of 12°, the light will be reduced to one-tenth, and so on. When two discs are employed, each having three sectors of 60° each, they can be so arranged on the axis as to give any desired result. If a single disc is employed, the openings should not be true sectors, having a definite angle at the centre, but cut so that the angle increases from the centre towards the circumference in a definite ratio. This may be so chosen that the weakening shall regularly increase from centre to circumfereuce just as the distance from the centre increases. When this form of disc is employed, the usual greased spot on the screen must be elongated instead of round, and as long as this opening. One end of this spot will be dark, the other light, and it must be noticed where this change occurs, and the amount of weakening read by a scale on the disc itself.

Endowment of Research.—We have frequently expressed our conviction as to futility of paying money to aid research. No discovery of any importance has ever been made through a promise of filthy lucre, and the world at large has never been kept out of an invention because encouragement was lacking to unearth it. But the great objection to paying away money in this way is, that it does not go into the pockets of the starving student or needy chemist, but simply to those who have the most interest. The poor inventor is as poor as ever, for the money falls to the clamouring ones in the front row, who look to these windfalls as a regular addition to their income. Let anyone look over the yearly list of recipients, and he will not find one in ten who has deserved reward more than any other of his brethren. In these circumstances, it is very satisfactory to find the gentle author of "Alice in Wonderland," and of that wonderful ballad "The Walrus and the Carpenter," hurling a

shaft at the monstrous sham, in the clever lines headed "Fame's Penny Trumpet-"

Blow, blow your trumpets till they crack,
Ye little men of little souls!
And bid them huddle at your back—
Gold-sucking leeches, shoals on shoals

Fill all the air with hungry wails—
"Reward us, ere we think or write!
Without your Gold mere Knowledge fails
To sate the swinish appetite!"

And, where great Plato paced serene,
Or Newton paused with wistful eye,
Rush to the chace with hoofs unclean
And Babel-clamour of the sty.

Be yours the pay, be theirs the praise;
We will not rob them of their due,
Nor vex the ghosts of other days
By naming them along with you.

* * * *

Go, throng each other's drawing-rooms,
Ye idols of a pretty clique:
Strut your brief hour in borrowed plumes,
And make your penny-trumpets squeak:

Deck your dull talk with pilfered shreds
Of learning from a nobler time,
And oil each other's little heads
With mutual Flattery's golden slime.

And when the topmost height ye gain,
And stand in Glory's ether clear,
And grasp the prize of all your pain—
So many hundred pounds a year—

Then let Fame's banner be unfurled!
Sing Paeans for a victory won!
Ye tapers, that would light the world,
And cast a shadow on the Sun.

Lewis Carroll.

DECOMPOSITION OF IODOFORM AND CALOMEL BY LIGHT.—Mr. S. J. Bendiner, of New York, points out that a mixture of iodoform and calomel—such as is not unfrequently prescribed by physicians as a dusting-powder for sores—is more or less affected by light, even when the chemical rays are excluded, and at ordinary temperatures. When heat is applied to the mixture, in a test tube, the decomposition takes place more rapidly, with evolution of the vapour of chloroform and hydrochloric acid gas, which latter strongly reddens litmus paper introduced in the upper part of the test tube. As an explanation of the reaction, the author cites the behaviour of mercuric chloride towards iodoform mentioned in Flückiger's Pharmac. Chemie. When these substances are brought together, iodo-chloroform, a substitution product of chloroform, is produced, which is almost identical in odour with the latter:

Iodo-form.		Mercuric chloride.		Mercuric iodide.		Iodo-chloro-form.
CHI_3	+	$HgCl_2$	=	HgI_2	+	$CHCl_2I$

A similar reaction probably occurs with mercurous chloride. —*Pharm. Rundschau* (Hoffmann's), 1883, 245.

PHOTOGRAPHIC CLUB.—At the next meeting, on Wednesday, January 9, the subject for discussion will be "Reducing Over-dense Negatives."

To Correspondents.

*** We cannot undertake to return rejected communications.

G. ST. JOHN BIGGS.—It is not ordinarily kept by stationers, but you can obtain it through any photographic stock dealer.

MAJOR-GENERAL P.—1. We will post you a sample, but you may gather some idea as to the depth of shade required by noting that two thicknesses will about equal one thickness of the "signal green" used on railways. The ordinary "signal green" will thus serve as a rough standard for depth of colouring, but not for the tint, as the cathedral green has a yellowish cast. 2. It certainly looks rather puzzling at first, but as the commercial preparation referred to is decidedly acid to test paper, the first assumption falls to the ground, and we have verified the statement that thirty minims are approximately neutralised by three-quarters of a minim of ammonia. 3. Commercial pearlash is quite pure enough for the purpose referred to.

MR. C. J. CHESTERMAN.—Thank you for note just to hand. Hope you have received YEAR-BOOK.

LITHO.—Nothing which has yet been published gives such a full and practical account of the various photo-lithographic methods as the articles by Major Waterhouse, which commenced on page 483 of our volume for 1882. The articles will be re-printed in book form.

J. C.—We do not know of one.

ARTHUR HOLLIS.—If you will send us particulars as to its composition, we shall have great pleasure in preparing some, and trying a few experiments regarding its merits as a reducer. It would interest our readers but little to read of trials made with a mixture of unknown composition.

ASPIRANT.—No two persons will give you exactly the same advice with regard to enlarging, but, circumstanced as you are, we should recommend you to set about it as follows:—Lay your original negative in a printing frame, and after having placed a gelatino-bromide plate behind it, expose to gas-light for a sufficient time to impress the latter. We should suggest half a minute at a distance of four feet from an ordinary burner, as a first trial of exposure. Develop the plate just as you would for a negative, and you will obtain the required transparency. This transparency is placed in the carrier of the enlarging camera, the film being directed towards the lens; and either of the lenses you mention will answer your purpose, provided that your enlarging camera is sufficiently long to enable you to obtain the required degree of amplification; but it may prove necessary to use the short focus objective with which the pictures were originally taken. The wet collodion process is perhaps more suitable than the gelatino-bromide method for making the enlarged negative; but before giving yourself the trouble of providing all the requisites for the wet method, you had better try how you can succeed with the dry.

A. B. C.—Either prepare them on glasses of the exact size required, or on plates which will cut to the required size. Varnish with the usual negative varnish, and mount in the frames with ordinary putty. Naturally, either the varnished side should be inside, or an extra glass should be placed in the frame first. You can mount silver prints on glass by the method described in the YEAR-BOOK (see article on "Colouring photographs against glass").

J. BERRYMAN.—We are sorry you have not the results of your experiments to hand, and we will communicate the contents of your letter to some who are working with the process. If you had used a dabber in a good condition, we do not think you would have experienced the clogging up you refer to. The fibres should be thoroughly imbued with ink, and yet the actual quantity present must be very small. This condition is realised by forcing a large quantity of ink with the dabber, and then removing the bulk of it by working the dabber against a piece of clean rag or canvas. Try again.

A. H. C.—The picture is very pleasing and decidedly effective.

CONSTANT READER.—For general work we should prefer either the first or the second. There is nothing to choose between them.

BISMUTH.—Next week.

S. W. S.—See Mr. Berkeley's article in the last number of the PHOTOGRAPHIC NEWS.

PAPYRUS.—The facts are as you suppose; but it does not by any means follow that your conclusions are correct.

The Photographic News Registry.

Employment Wanted.

Manager of Marion's Works.—C. Francis, Marion's Works, Southgate, N.
Retoucher & Assist. Operator.—A. B., 6, Oswald-rd., Milverton, Leamington
Printer & Toner, Berlin Medals.—G. Dendle, 27, Portland-st., Ilfracoombe.
Young Lady for Reception Room.—S. F., 69, Grosvenor-rd., S.W.
Enlarger or Dry-plate Maker.—B., 7, Northumberland-ter., Regent's-pk.
Operator, dry plate manufacturer.—J. R. H., 11, Lewisham High-rd., S.E.
Operator, retoucher, all round.—Mr. Ems, 12, Bartholomew-ter., Exeter.
Reception Room, book-keeper, &c.—M. R., 34, High-st., Sittingbourne.
Lady, to mount, spot, &c.—A.S., 3, Silchester-rd., St. Leonards-on-Sea.
Retoucher, can operate.—H. A. G., 35, Brooker-st., Hove, Brighton.
Retoucher, operator, or manager.—J. Jones, 79, Euston-st., Euston-rd.
Operator, gen. assist., good all-round.—T. W. 59, Tredegar-rd., E.
Retoucher and assist. operator.—A. R., 27, Cross-st., Ryde, I. W.

Employment Offered.

Printer, Toner, & Vig. (first-class).—J. H. Goldie, 7, Temple-st., Swansea.
Spotter, good.—W. and A. H. Fry, 68, East-st., Brighton.
Portrait Painter, experienced.—W. H. Ledgard, Lumb-la., Bradford.
Young Man (wet-plate) for Copying.—Hill & Co., 45, Essex-st, Strand.
Port. Painter (lady or gent.)—J. M. D. Worsnop, 154, Leeds-rd., Bradford
Artist for carbon enlargements, &c.—C. F. Treble & Co., 371a, Brixton-rd.
Silver Printer, quick & experienced.—C. F. Treble & Co., 371a, Brixton-rd
Lady, exp., for mounting & spotting.—Mr. Gandy, 5, Bishopsgate-without.
Printer, artistic vignetter.—E. D Lavender, Tweedy-bldgs., Bromley, Kent.
Artist for monochrome, carbon enlargements, &c.—Lex, *Photo. News* Office.
Miniature Painter, first-class.—Lex, *Photo. News* Office.
Fitters, artificial light apparatus.—Luxograph Co., North-end, Croydon.
Learner, for retouch.—N. M., c/o. Shew & Co., Wardour-st., Oxford-st., W.
Operator, first-class, & to retouch.—Hodson, 8, Market-pl., Retford.
Enlarger for general work.—D. S., *Photo. News* Office.
Dry-plate man, first-class.—Dry plate, 37, Thornton-st., Brixton.
Operator and retoucher.—F. Baum, c/o Disderi & Co., 4, Brook-st., W.
Female Assistant Printer.—F. Baum, c/o Disderi & Co., 4, Brook-st., W.

THE PHOTOGRAPHIC NEWS

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LIBRARY

CONTENTS.

DIFFUSED LIGHT FOR THE DARK-ROOM.

SOME experiments we have recently undertaken in connection with the illumination of dark-rooms bear so much upon a matter of every-day importance to the photographer, that we do not delay to publish them. The tests, we may mention at the outset, were made with a view to selecting a material for the developing room rather than for emulsion making, for it stands to reason that illumination which may well serve the former purpose, may not answer the latter.

Our experiments were very simple. A steady-burning fish-tail gas-burner was employed as a standard light, and as this was not more than an hour in actual use, we could rely upon its constancy. In employing a light for developing, there must always be a sort of "give and take" arrangement, or, in other words, the photographer must weigh the disadvantages of admitting a little injurious light in order to get the advantage of seeing what he is doing; and the best medium for a dark-room window is naturally that which admits sufficient light to work by, and which quantity of light does least injury to the sensitive film.

We made our tests as follows:—

1. To estimate the actinic value of the light admitted.
2. To ascertain the visual value of the light admitted.
3. To note the pleasant character or otherwise of the light.

Naturally, the test for actinic light came first, for unless this was satisfactory, there was no need to go further. The well-known Warnerke transparent screen with numbered squares 1 to 25 was employed as negative, and put in a printing frame with a gelatine plate behind it. This plate in each instance was exposed to the gas-burner for the space of two minutes exactly, at a yard distance, precisely, from the flame. The development (pyrogallol) was in all instances the same.

In front of the Warnerke screen, pressing against it, was tried:—

1. One green and one orange glass combined: Result, the No. 13 very legible.
2. Two green glasses and one orange glass: Result, the No. 9 very legible.
3. One orange glass and one ruby glass: Result, No. 1 slightly visible, and a trace of No. 2.
4. A stout yellow paper, supplied by Harvey Reynolds: Result, no trace of the scale visible.
5. Four sheets of yellowish tissue paper, known as "stout buff," and used for copying letters: Result, no trace of the scale visible.
6. Three sheets of "lumberhand" paper—a light yellow packing paper universally employed: Result, no trace of the scale visible.

In the face of these results, it was unnecessary to proceed any further with experiments Nos. 1 and 2.

The visual tests were next taken. For this purpose—for want of a better apparatus—a Sciopticon lantern was lit, burning a double paraffine wick. The lantern has in rear, as most of our readers know, when the reflector is turned back, a clear opening whence the flame is distinctly seen. This opening was closed successively by:—

1. One orange glass and one ruby glass: Result, the double flame of the lamp was to be seen distinctly through the ruby glare, and small type was legible within six inches of the coloured glass.
2. Four sheets of "stout buff": Result, the double flame of the lamp was not to be seen at all, but the visual effect was such that small type could be read at more than twelve inches distance.
3. Three sheets of lumberhand: Result, scarcely to be distinguished from No. 2.
4. Stout yellow paper (one sheet) of Harvey Reynolds: Result, same as Nos. 2 and 3.

Finally came the question as to which was the pleasantest light? The red glare of the glass screen was at once pronounced against, in favour of the papers, all of which gave a most agreeable illumination. The Harvey Reynolds gave the palest light, then came the "stout buff"; while the lumberhand was slightly more orange than either of the others.

Indeed, the difference was so slight between the three papers, that there was scarcely any choice, and our readers who wish to employ paper screens may elect as they will. On the side of the "stout buff," it may be advanced that being thin, you may use it in one, two, three, or four folds; while the lumberhand is slightly thicker, and the Harvey Reynolds thicker still. Against the buff may, perhaps, be urged that it is unsized; while the Harvey Reynolds and lumberhand are sized. The "stout buff," examined chemically, is shown to contain both salts of iron and chromium, the latter, no doubt, introduced in the form of bichromate of potash. A very dilute acid discharges the yellowish colour from the paper at once. There is, in fact, no doubt in our mind that a very suitable yellow paper might be prepared by the photographer himself, using a solution of bichromate of potash. This, combining with the size of the paper, forms, of course, a pigment that darkens slightly in light, but the amount of gelatine and chromate salt employed could be reduced to a minimum.

We may add that we examined our combination of orange and ruby glass by means of the spectroscope in comparison with the "stout buff" paper. The glasses extinguished from the orange region the whole of the more refrangible portion of the spectrum; while even four thicknesses of "stout buff" failed to extinguish the

green. In short, the paper let pass red, orange, yellow, and green, while the glasses only permitted the red and orange to get through.

How is the superiority of the paper to be accounted for in these apparently contradictory circumstances? For on the one hand the photographic and visual tests prove the paper to be more valuable, while on the other, the spectroscope gives judgment in favour of the glasses. We think the reason is not far to seek, and it is one that has before led us to advise not too blindly to follow the dictates of the spectroscope. It is a mere question of diffusion of light.

In support of this theory, there is the fact that in making the visual test with the ruby and orange glass, the eye saw plainly the double flame of the lamp, and yet *less* visual light was emitted than when a paper screen was used, which effectually prevented any view of the flames. To put it another way, if we desired to look at the sun, we should not employ the paper screen, but should have perforce to use glass—the ruby and green would do very well—for the rays in the latter case are not so much interfered with. If it were simply the opacity of the paper pulp itself stopping the light—it does stop some, of course—then there would be an absence of visual light: but as we have shown in all three samples of paper tried, much more light of this kind got through than traversed the glass screen. Still, diffused white light will not do, for white paper, even when thick, lets through a vast amount of injurious illumination: this must be of a yellow or ruddy character to be comparatively harmless.

We next went a step further. We took in hand once more the ruby and orange glass, and went back to make another actinic experiment. We have said that the Warnerke screen, when these two glasses were upon it, printed off a faint No. 1 and No. 2 of the scale. We exposed precisely as before, but we lifted off the ruby glass, and substituted in its place a sheet of ground glass. We were, therefore, exposing a bromide film under a single orange glass and ground glass. What was the result? Why, fully equal to that previously obtained; there was no trace of any No. of the Warnerke scale.

The ground glass and orange glass were now taken to the sciopticon lamp, in order to make the visual test. As in the case of the papers (but unlike the ruby and orange glasses), the formation of the flames could not be made out, and when an essay was made at reading, the small type was found to be legible at more than *three feet distance*.

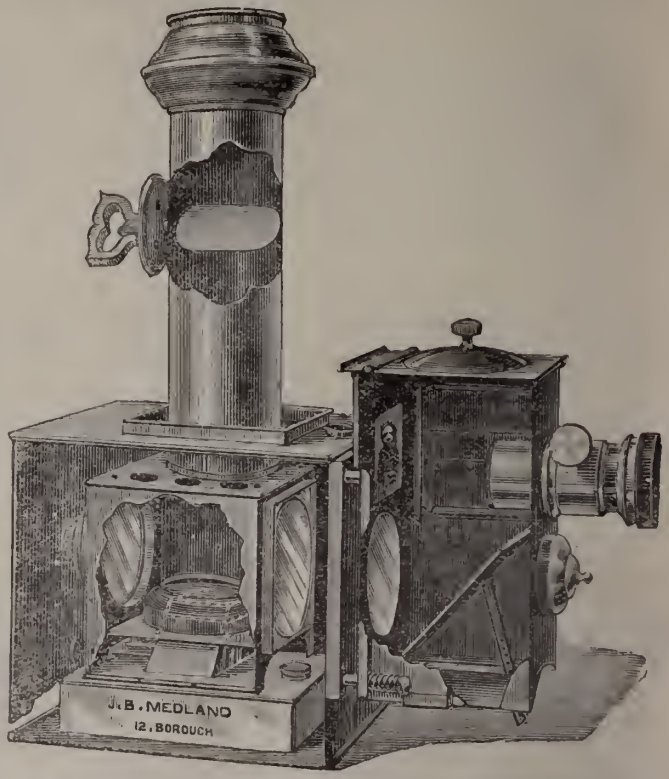
The experiment speaks for itself, and it is so simple that any of our readers may repeat it in a few minutes. To employ ground glass for dark-room windows is, as we are aware, no novelty, but the extent to which yellow diffused light may be used with impunity has never been so clearly shown; nor do we think, has a single sheet of orange glass combined with ground glass ever been proposed for dark-room illumination.

We are far from saying that yellow or orange diffused light is the most advantageous—giving least actinic and most visual light—for dark-rooms; that is a matter for after experiment. Meanwhile we trust our readers will give orange and ground glass a trial in their developing rooms.

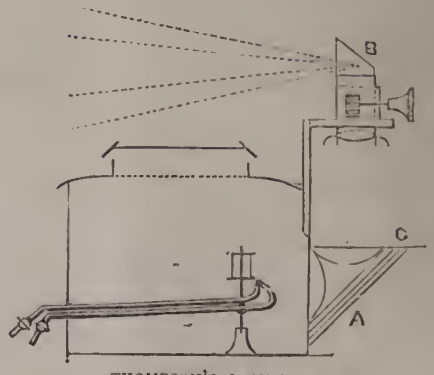
A NEW ARRANGEMENT OF THE OPTICAL LANTERN.

FEW scientific instruments are now so popular as the lantern, and, as a consequence of this, improvements are frequent, and we now place before our readers a sketch of one of the latest models.

The "Pentaphane," as Mr. Medland calls his new lantern, is provided with a paraffin lamp, or rather a battery of lamps, for there are no less than five wicks; while the intensity of the illumination is such as is calculated to rather surprise those who have been used to the old form of lantern. The especially novel feature of the "pentaphane" is the arrangement of the front, this being provided with an ingenious arrangement for showing opaque objects. If the mirror, which is shown mounted at an angle of 40°, is lowered by means of the casement bar, and the objective is screwed into the lower flange, all is ready for exhibiting the ordinary transparent slides; but to raise the mirror and screw the lens into the upper opening is not the work of ten seconds. Of course it will be obvious to our readers how the light is reflected upwards upon an opaque object which is to be exhibited (as, for example, the portrait shown in the diagram).



We would suggest one slight alteration which would make the lantern even more serviceable as an instrument for scientific demonstration, and that is, the addition of a horizontal stage between the two flanges, and a third flange



THOMPSON'S LANTERN.

at the top of the front compartment. A mirror (silvered on the face) or a prism must now be added to the objective, and we have an arrangement having all the characteristics of the convenient instrument which Professor Sylvanus Thompson recently used at the the Society of Arts.

If the proposed addition were made to Medland's lantern, we should have an instrument well adapted for all the purposes of the science lecturer. Ordinary chemical decompositions could either be shown in a vertical cell, or an open trough on the horizontal stage; the former arrangement being generally more convenient for precipitations and colour tests, the precipitant being allowed to flow slowly from the point of a pipette; while the horizontal arrangement is better for such an experiment as the formation of the so-called ammonium amalgam on the growth of crystal. Electrical and magnetic experiments are especially easy on the glass stage, as Professor Thompson so ably demonstrated on the occasion we referred to. It is also extremely easy to develop a collodion negative before a large audience if a pale yellow glass is placed on the stage. Indeed, there are very few branches of experimental science which would not profit by the extensive use of the lantern. Another circumstance which gives the horizontal stage arrangement value for the purposes of demonstration, is the ease with which the lecturer can point out the characteristics of his diagram, or even write on the slide, the prism or mirror serving to correct the reversal caused by the lens.

A SUN STEAM ENGINE.

The construction of a motor or engine set in action by sunlight is not new. More than a year ago there was a motor of this nature exhibited in Paris, in the Tuileries Gardens, the steam generated on a clear morning in May being sufficient to set in action a printing machine by which a small newspaper was printed. This French sun-motor was shaped like a huge umbrella, open, but inverted; the concavity of the umbrella reflected the sun's rays upon the stick, which was simply a blackened tube containing water. The heat concentrated upon the tubular boiler was sufficient to get up steam in half an hour, and to regularly work, as we have said, a small engine as long as sunlight lasted.

Captain Ericsson's sun steam-engine, or sun-motor, as he prefers to call it, is not unlike the French apparatus of which we have just spoken. There is a thin tubular boiler, if it may be so called, but this contains either steam or air. This cylinder is shown at *a* in fig. 1. This boiler

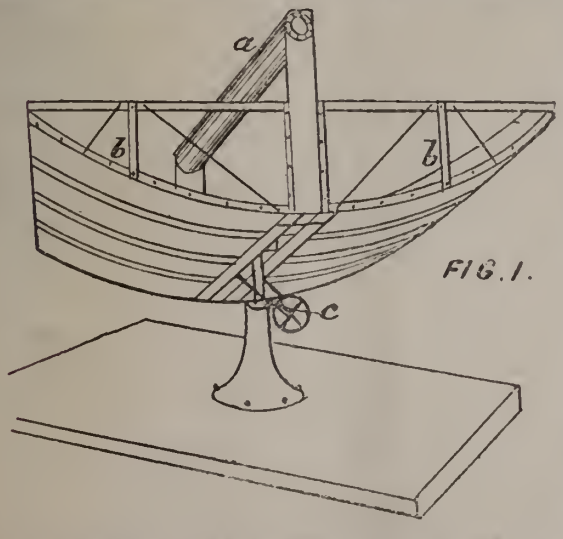


FIG. 1.

is also blackened to absorb the sun's rays, which are reflected upon it from the troughs *b*, *b*. A contrivance at *c*, where the trough is pivoted, keeps the trough turned towards the sun in the best position to receive the rays.

Fig. 2 will explain the apparatus yet more clearly. The heater or boiler is shown again at *a*, and the reflecting

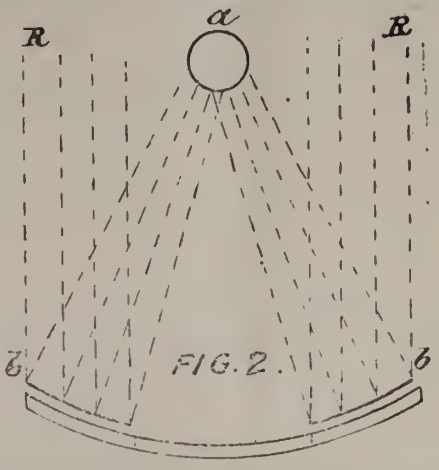


FIG. 2.

surfaces of the trough at *b b*, while the dotted lines *R R* indicate the manner in which the rays fall upon the trough and are reflected again upon the boiler *a*.

Captain Ericsson says of the trough, in *Nature*:—"The bottom consists of straight wooden staves supported by iron ribs of parabolic curvature, secured to the sides of the trough. On these staves the reflecting plates, consisting of flat window glass silvered on the under side, are fastened.

"It will be readily understood that the method thus adopted for concentrating the radiant heat does not call for a structure of great accuracy, provided the wooden staves are secured to the iron ribs in such a position that the silvered plates attached to the same reflect the solar rays towards the heater. Fig. 2 represents a transverse section of the latter, part of the bottom of the trough, and sections of the reflecting plates; the direct and reflected solar rays being indicated by vertical and diagonal lines.

"Referring to the illustration, it may be said that the trough, 11 feet long, and 16 feet broad, including a parallel opening in the bottom, 12 inches wide, is sustained by a light truss attached to each end; the heater being supported by vertical plates secured to the truss. The heater is 6¼ inches in diameter, 11 feet long, exposing 130 × 9·8 = 1274 superficial inches to the action of the reflected solar rays. The reflecting plates, each 3 inches wide and 26 inches long, intercept a sunbeam of 130 × 180 = 23,4000 square inches section. The trough is supported by a central pivot, round which it revolves. The change of inclination is effected by means of a horizontal axle—concealed by the trough—the entire mass being so accurately balanced that a pull of five pounds applied at the extremity enables a person to change the inclination or cause the whole to revolve. A single revolution of the motive engine develops more power than needed to turn the trough, and regulate its inclination so as to face the sun, during a day's operation.

"The energy developed in the heater works a steam-engine, the working cylinder being 6 inches in diameter, with 8 inches stroke. The piston rod, passing through the bottom of the cylinder, operates a force-pump of 5 inches diameter. By means of an ordinary cross-head secured to the piston-rod below the steam cylinder, and by ordinary connecting rods, motion is imparted to a crank shaft and fly-wheel, applied at the top of the engine frame; the object of this arrangement being that of showing the capability of the engine to work either pumps or mills. It should be noticed that the flexible steam-pipe employed to convey the steam to the engine, as well as the

steam chamber attached to the upper end of the heater, have been excluded in the illustrations. The average speed of the engine during the trials last summer was 120 turns per minute, the absolute pressure on the working piston being 35 lbs. per square inch. The steam was worked expansively in the ratio of 1 to 3, with a nearly perfect vacuum kept up in the condenser inclosed in the pedestal which supports the engine frame.

"In view of the foregoing, experts need not be told that the sun-motor can be carried out on a sufficient scale to benefit very materially the sun-burnt regions of our planet."

GELATINO-BROMIDE PAPER FOR POSITIVE PICTURES.

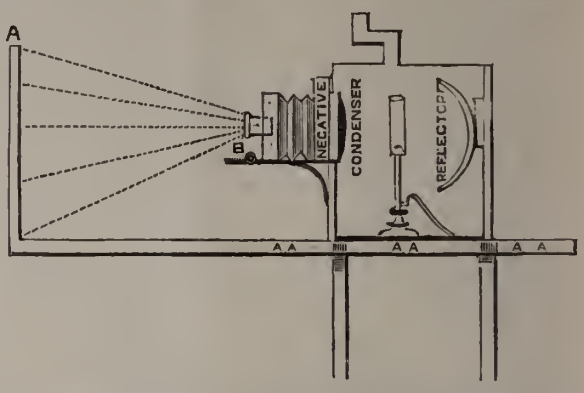
FOURTH ARTICLE.

IN the previous article we described a means of obtaining enlargements by converting the dark-room into an enlarging camera; we also touched on the salient points regarding vignetting, and a suitable illumination for an enlarging camera or lantern by means of artificial light. We shall continue the consideration of the latter subject a little further in the present article, by giving a few practical details of the method of fitting and using such an apparatus.

It will be readily understood by those of our readers who are possessed of an ordinary optical lantern, or a sciopticon; their requirements are exactly fulfilled, the sciopticon being well suited for producing the smaller sizes. The luxury of a lantern is not found in every household, but the means of constructing a suitable arrangement is within the reach of every one possessed of a lens. Probably nothing better for the purpose can be desired than the tin biscuit box suggested by Morgan and Kidd, and used by those gentlemen when demonstrating before the South London Photographic Society and other subsequent gatherings. This arrangement, it will be remembered, served the purpose of emitting the rays which traversed from a paraffin lamp, through condenser, negative, and lens, to the focal plane on which was arranged the sensitive paper. One of the sides was fitted with ruby glass, which permitted development being carried on in safety, there being no other source of light in the room after the lens had been capped.

Mons. Hutinet, when illustrating his mode of enlarging recently in this country, employed a very similar arrangement, excepting, however, a long focus lens was used, and no condenser employed. The use of long focus lenses do not obviate the necessity of using a condenser; they are employed simply on account of their greater covering power, the duty of the condenser being to provide an equal illumination to all parts of the small negatives. To overcome the difficulties met with when no condenser is available, it is customary to employ a screen of ground glass, which, while permitting a more equal illumination by diffusion, necessitates the use of a much longer box, in order that rays of light emitted from an Argand gas or paraffin lamp may be evenly diffused over the ground glass screen, no light being allowed to escape beyond the rays emitted through the lens during focussing and exposure.

The requirements are, then, a metal or other case which shall be light-tight (except when the lens is uncovered) fitted with a metal chimney to carry off the heat from the lamp, a lens, and small camera attached to a hole in the front, a frame for securely holding the negative in the position usually occupied by the dark-slide in the camera (film side of negative towards the lens); immediately behind this is fixed a four or six-inch condenser, according to the size plate used. Failing this, a sheet of ground glass, and behind this, at a suitable distance, a gas or paraffin lamp with a suitable reflector. The accompanying sketch will indicate very clearly the positions occupied by the various parts of the apparatus when in use. The upright board, A, upon which the sensitive material is placed to receive the enlarged image, should be capable of sliding nearer to or farther from the camera, as shown at A A. The distance



between the lens and negative should also be adjustable, as shown by the rack-and-pinion at B; the reason having been pointed out on page 786 of the last volume.

Contact Printing.—The great ease combined with the rapidity and certainty with which positives can be printed in contact with negatives and afterwards developed, renders bromide and chloride of silver of the greatest service to the commercial world. With regard to the quality of surface being suitable for the smaller sizes, we may say there is not the least difficulty in obtaining a surface as smooth and transparent as a highly-glazed albumen print if such a result be considered desirable, for very little consideration will reveal the fact that it is by no means more difficult to squeegee the freshly-prepared gelatine positive down on a collodionized glass plate than it is a carbon print, as in the Lambertype process or the ordinary enamelling of silver prints.

In the production of certain subjects, exceptions may be taken to the neutral character of the colour. To such exceptions we would say that the objection can be met by employing citro-chloride of silver emulsified in gelatine. Such an emulsion spread on a suitably surfaced paper can be printed out in less time than is required for printing on ordinary sensitized albumenized paper; the after operations of toning, fixing, and washing being the same, and the results are quite equal in every respect; but on this subject we shall have more to say at a future time.

There is not the least difficulty in printing at least twenty impressions an hour on bromide paper from one negative, and we think that circumstances alone should largely influence photographers to favour its use wherever possible; besides, a very agreeable tone is obtained by development with ferrous oxalate, which may be modified by the after process of toning if this be considered necessary.

Briefly, then, negatives are charged in the ordinary way by placing the gelatine surface in contact with the varnished side of the negative in a printing-frame, and erected at right angles to the source of light. If one second's exposure, one foot from a gas jet, gives a good result, then any number of such exposures may be made without any variation.

The mode of obtaining given degrees of magnitude, and the probable or approximate duration of exposure, have each received a due share of attention previously, and on the subject of developing we need say very little, beyond mentioning that ferrous oxalate or alkaline pyrogallol may be successfully employed with the addition of a small quantity of citric acid or an alkaline citrate, such as the salt, citrate of potash. By the addition of a small quantity of a citrate, development is somewhat retarded; but there is a decided gain in the character of the image obtained. In

using ferrous oxalate developer, it is found that the employment of saturated solution of ferrous sulphate and potassium oxalate give much better results than when less concentrated solutions are used. Each solution should be filtered before mixing, and one part of the iron solution should be added to four parts of potassium oxalate solution (not the oxalate to the iron); the addition of one-fifth of a grain of bromide of potassium per ounce of developer will be found a very good working proportion. Should the positive be too much exposed, which may be known by the image developing up very quickly, and wanting in contrast, it may be saved by pouring off the developer, diluting it with an equal volume of old ferrous oxalate developer, and returning it again to the developing tray with the addition of a few drops of a twenty-grain solution of potassium bromide. As a rule, when the exposure has been too little, no amount of coaxing will produce a good positive, the result of such being a black and white print, totally deficient in harmony of tone. Instead of doctoring up such a result, it is by far wiser to make a second exposure, just doubling the time given to the first. On no account should the positive remain in the developer until the tones are well out and the shadows very strongly marked, because a deepening action always takes place in the fixing bath. The strength of the fixing bath is the same as for silver prints, one to five; but the time of immersion need not be quite so long, ten minutes being ample for all purposes. After a prolonged washing, to rid the paper of the last traces of the sodium salt, they are passed through acidified water (two per cent. solution of sulphuric acid), again washed, dried, and finished; should there be any tendency to peeling, the acid bath may be saturated with common alum.

There is no need to quote formulæ here; anything the reader is not familiar with, will be found under the heading of "Standard Formulæ," in the present Year-Book.

CHEMICAL EXPERIMENTS IN THE LANTERN.

There is always a charm about a pretty and striking experiment that an audience, whatever its nature, seldom fails to appreciate. Let an experiment be ever so simple, or let it be only partially calculated to illustrate the subject of a lecture, it is not only young people who delight in it, but "children of a larger growth" will evince an interest in and applaud it. On a good experiment the success of a lecture will often depend, providing it is done on a sufficiently large scale. Even famous men of science look to successful demonstrations to gain the attention of their audiences. And not only in the lecture room, but at home, also, may such experiments be turned to account, and instruction follow what, in spite of all that is frequently said to the contrary, is done quite as much for the sake of amusement.

Photographers are not slow to take advantage of this popularity of experimenters, and often we see this exemplified in the proceedings of societies, where the practical demonstration of a process draws the attention of those who would otherwise scarcely give it a passing thought, but who go away to repeat the experiment, or try the process in their own laboratories or dark rooms. It would be difficult to estimate how much gelatino-bromide paper, to take a notable example, is indebted for its popularity, among amateurs, at least, to the way its development has so frequently been shown in public; though, at the same time, it cannot but be admitted that its own good qualities, its practical usefulness, and readiness of manipulation, furnish the main reasons why it is in demand. There is one class of experiments, however, which has hardly received all the attention it deserves—namely, chemical experiments performed in the lantern, an image being thrown on to the screen. Not only are such experiments attractive in themselves, but they may be put to real service in showing on a large scale many of the principles on which the science of photography (to bring the matter home to our readers) depends. The apparatus required is simple and easily constructed, the small amount of trouble involved being amply repaid.

The first desidirata (next to the lantern) are a few suitable cells. We mention two ways in which these may be constructed. The first method is to obtain two pieces of clear glass, preferably thin patent plate, of a suitable size. Then cut some narrow strips of thick plate glass, and smooth the edges by rubbing them down on a piece of flat stone; the polished surfaces of these strips should also be rubbed down to give them a ground surface, which will afford them a stronger hold. The cell may then be put together by warming the glass and applying marine glue, with the aid of a heated piece of iron, an old file—for instance—or, in the absence of anything better, that useful domestic implement, the kitchen poker. One disadvantage of marine glue, however, is that the heat from the lantern, if it is in for a long time, may cause it to leak. Another good way of joining the glass, and one which requires less skill, is to cement it with bichromated gelatine, and expose to light; if this plan be adopted, it is advisable to paint the cemented edges, inside and outside, with sealing-wax varnish or gold size applied with a camel-hair pencil. Gold size may itself be used to cement the glass; but, except for microscope cells, we do not care for this. A very good form of cell may be made by enclosing two pieces of glass in a wooden frame the size of an ordinary carrier but thicker, these two pieces of glass being separated by a piece of rubber tubing, or, better still, a strip of solid rubber such as is used for catapults, bent round to form the bottom and sides; the glass plates are placed sufficiently near together to squeeze the rubber and make a watertight joint. One great advantage of this form of cell is, that it can readily be taken to pieces and cleaned when necessary.

Few of the lanterns now manufactured require any alteration to render them available for this class of work. In most of them the fitting which receives the slide carrier—in this case the cell—is open at the top as well as at the sides; if the lantern does not already possess this convenience, an opening must be cut. A few minor pieces of apparatus required are—a small funnel, one or two pipettes, and a thin glass stirring rod.

We give a few examples of the kind of experiments which may thus be shown to a large audience—precipitations, for instance, as by dropping solution of nitrate of silver into a solution of a chloride, or *vice versa*, and subsequently dissolving the precipitate in hypo; or the precipitation of mercuric iodide by adding potassic iodide to mercuric chloride. On the screen the particles will appear to move upwards instead of falling down; but this only enhances the effect. A very pretty experiment is to add a drop of solution of red prussiate of potash to a weak solution of ferrous sulphate, by way of illustrating iron processes; another pretty effect is, add a solution of a sulpho-cyanate to a weak solution of ferric chloride; the absorption of iodine by hyposulphite of soda; the bleaching action of such compounds as sodic hypochlorite on a solution of some dye, such as turmeric or indigo; the effects of acids and alkalis on solutions of blue and red litmus, &c., &c. So many experiments will naturally occur to the mind of the reader, that it is needless for us to enumerate more. One of the best things we have seen demonstrated in this way, though it is hardly within the province of the photographer, was the electrolysis of a substance, a solution of chloride of copper being used to which a small quantity of a solution of indigo in sulphuric acid was added. As the chlorine gas was evolved in little bubbles at the positive pole, the indigo was rapidly bleached, the experiment being rendered very striking by dividing the cell into two parts with a little roll of blotting-paper, a terminal being placed in each of the two divisions of the cell.

JOHN HENRY DALLMEYER.

"ON the 30th ult., off the coast of New Zealand, John Henry Dallmeyer, Esq., of Sunnyfield, Hampstead, and 19, Bloomsbury Street, London, in his 53rd year," is the announcement of sad news indeed, that comes to us from beyond the seas. The gentle spirit of a great and good man has fled, his unwearying brain has ceased to throb, and the world is the poorer of one who was as kindly as he was gifted, as modest as he was rich in talents. A generous master, a sympathetic friend, with the soft heart of a woman, and the warm impulse of a true benefactor, the late Mr. Dallmeyer is remembered by those who knew him with a yearning regret that, sad to say, is but rarely felt in this work-a-day world of ours.

> "His life was gentle; and the elements
> So mixed in him, that Nature might stand up
> And say to the world, 'This was a man!'"

Only 53! And yet his name has been for a generation, almost, prominently before the world of astronomy, micrography, and photography. That no man is a prophet in his own country is a proverb well exemplified in the late Mr. Dallymeyer. For his work as a scientific optician, honours came to him spontaneously from abroad, but at home he was known simply as a Fellow of the Royal Astronomical Society. America bore high testimony to his works, he earned the thanks of high officers in Austria and Germany, Russia constituted him a Chevalier, and France nominated him Officer of the Legion of Honour.

These honours were rendered for special optical work outside the domain of photography; but it is by his eminent services in the construction of improved lenses for the camera, that the late Mr. Dallmeyer was best known to our readers. His instruments are universally prized. Their high cost is no bar to their general employment, and in the studios of every civilised nation the Dallmeyer lens is to be found. Nor was this success undeserved; for rumour says that every instrument that passed out of the Dallmeyer establishment, passed first through the master's hands.

Sad to relate, the strain of work was too much for a brain so delicately poised. For nearly three years past, the late Mr. Dallmeyer had been compelled to abandon work; indeed, it was for the sake of health that he undertook this voyage to Tasmania and New Zealand. Fortunately his eldest son, Mr. Thomas R. Dallmeyer, had been fitted by parental and University training to undertake the father's duties, so that, despite the latter's absence, the establishment in Bloomsbury Street has gone on in the same methodical and straightforward manner; and we have no doubt that, under the same able direction, it will still continue to prosper.

By-the-Bye.

BAD SITTERS.

WE spoke recently of good sitters, and we said that if these were strangers to the studio, it was as much the fault of the photographer himself, as anybody else. In other words, we gave it as our opinion that in the case of many visitors to the studio, it was in the photographer's hands to make them into good sitters. We are bound to say, however, that this is not so with bad sitters. These latter, or at any rate the greater number of them, are beyond the control of the best-tempered principal or most painstaking assistant. They are bad paymasters and bad models; they are "uppish" and discontented when they make their first appearance in the studio, and they display the same unamiable qualities when you bow them out for the last time.

And who are the bad sitters? Well, one class of them is easily named—that which knows something about photography. Indeed, it may almost be taken as an axiom that there is no worse sitter than the *soi-disant* photographer, and the less he is acquainted with the art, the more unsatisfactory he is. He knows "the whole box of tricks," he tells you, and you may infer also that if he pays you money, he is well aware it is being thrown away more as a charity than anything else. He knows all about it, bless you! It is no use your trying to take him in with your posing, your lighting, your retouching; you may pretend to spend half-an-hour arranging drapery, in managing the illumination, in attempting to secure this position or that expression; but, thank Goodness! you can't hoodwink him.

Of course, we exclude from this category all who are capable of taking good pictures, for these know full well what is involved in securing high-class negatives one after another, which shall be soft and brilliant, and shall not offend against good taste nor well-known art canons. We are far from saying that the honest artist-photographer, whether he is an accomplished amateur or skilled professional, takes a pleasure in plaguing his brethren; we repeat, he knows better, for he is well aware how much skill, judgment, tact, and patience are necessary to the fulfilment fo good work. But it is not so with those who have but a smattering of the art of photography, who know that you must put your head under the cloth to focus, and must pull out the dark slide before you can expose. They are acquainted with the cost per dozen of the dry plates you are using, and they know, too, the price of the albumenized paper upon which you will presently print their effigies. Even the work of retouching has no mysteries for them; they are thoroughly aware it is done with a finely pointed pencil—you can't have the point too fine, you know—and they volunteer the information that silver prints are given to fading, unless you take great care in the washing of them.

This sitter it is who tells you he has a brother, a most accomplished painter, who, if not actually a Royal Academician, lives next door to one. His cousin, too, is a most famous man of science, and with him he is going to take up photography, not as a mere picture-taker, but, seriously, to find out all kinds of things—colours, you know, and instantaneous plates, and that sort. He never gives you a moment's peace the whole time he is in your studio; he exhausts you, himself, and every subject that happens to turn up. There is nothing he does not know, and he regards it as an insult if you ask him to comply with this or that demand. The first moment he enters, he demonstrates his superior wisdom, and you will do well if you can keep your temper in listening to his platitudes.

Next in the list of bad sitters to him who knows something of photographic manipulation, is the man or woman who has been an art-student at some time or other. The latter acts upon this simple and delightful notion: that he is an artist, and the photographer is not. Their singularly fresh and unaffected bearing in the studio not unfrequently baffles the photographer altogether, so much so, indeed, that he is sometimes constrained to seek sanctuary in the dark-room, there to recall once more his proper position. Is he "boss of the concern," he asks himself, after the manner of a defiant Yankee, or is he not? If he possesses courage and self-control, he will go back and have his own way; still, he is the wiser man who kills his fish with plenty of line, for to lose one's patience and temper is often to lose the quarry at the same time.

Sometimes a sitter is bad only because he has brought as companion "an artist to pose him." In some studios such posing is not permitted; in others, the photographer takes care to secure his fee, stipulates that his work is undertaken without responsibility, and then follows Dogberry's advice to let him go, and thank goodness you are rid of him. One day, at a public dinner, a neighbour asked us whether the Mr. Medallist at the other end of the table was the well-known photographer who had se-

cured so many awards. Our reply was in the affirmative. "Ah, I knew him well when he was at Seabourne; I often looked into his studio, and he used to ask me to pose his sitters for him." Naturally, this was very interesting, but when we made known to our neighbour that Mr. Medallist was a personal friend, and that we would introduce him after dinner, the art gentleman declined the honour, and thought Mr. Medallist would scarcely remember him after so many years. If we had not offered the introduction, our new friend would doubtless have dilated upon the valuable aid he had given, and possibly laid claim to the medals bestowed on the photographer.

If the art student has studied sculpture, he may be able to give the photographer a few valuable hints; but if he is a painter who has no knowledge of photography, then he will most assuredly be a hindrance rather than a help. If proof of this were wanting, look at some of the photographs of great painters that have been produced—of Millais, of Holl, of Marcus Stone, where these gentlemen have posed themselves. Millais, with his pipe in his mouth and his arms tightly folded across his breast—his favourite pose, apparently, before the camera—is the acme of wretchedness and angularity. No doubt the clever painter thought he was placing himself in a most free-and-easy, here-you-are sort of position, and probably he himself felt free-and-easy enough at the moment he was photographed; but in the result no pose could be more constrained. The exception that proves the rule to all this is Rejlander's picture of Gustav Doré, which has all the grace and repose that an artist photographer can bestow.

If, then, the great painter often fails when he enters the domain of photography, what can be expected from the gentleman who formerly studied in an architect's office, or the lady who attended an art school once in her life? This model always knows better than the photographer; would rather sit when asked to stand; and prefers to show his full face, although the line of his nose is not straight, his lips thin, and his eyes unequal. We envy no photographer who is brought face to face with a bad sitter of this kind, and well knows that, do what he will, he cannot give satisfaction. If he lets such a model have it all his own way, the result will be, in nine cases out of ten, a woeful failure. An attempt on the part of the sitter to be naive, bright, and unconstrained, generally ends in the pourtrayal of insufferable conceit; while on the other hand, a simpering pose will result in that dying-duck expression which is, perhaps, the most ludicrous of all. Posing oneself, as we have before pointed out, is not unlike acting. An amateur actor may deport himself as a gentleman well and gracefully in the drawing-room, but let him try to emulate Charles Matthews on the stage, and he will find he has over-matched his capacity. He may please himself vastly, and be altogether at his ease, when he throws himself into an arm-chair, or when he puts his hands into his pockets and his feet upon a couch; but to the audience his whole appearance is awkward and vulgar. And so it is in the posing-chair: it is not one pose in ten that subsequently pleases the person who has chosen and assumed it.

The true artist, let it be said to his credit, seldom interferes with the work of the photographer; he is not a bad sitter, and, therefore, to him our words do not apply. So many of our good painters, too, have taken up with photography of late, and have found how difficult it is to secure a succession of even tolerable pictures, that every day that passes secures more of their sympathy.

Bad sitters are, for the most part, then, those who, having a smattering of photography or a smattering of art, use their slight knowledge to plague the photographer. There are other bad sitters, no doubt—sitters who do not pay, sitters who are mean, and sitters who are given to re-sitting out of all conscience. But these cannot be grouped into classes, and, since they do not belong to any community, are not worth special consideration.

The next "By-the-Bye" will be "Who is a photographer?"

FRENCH CORRESPONDENCE.

M. MAUDIT'S SHUTTER—STARCH IN EMULSION—DRYING PLATE APPARATUS—MEDICAL PHOTOGRAPHS—DIRECT LIFE-SIZE PRINT—DIACHYLON PLAISTER FOR FIXING PELLICLES—DEVELOPMENT AND FIXING OF A PELLICLE—NEW PHOTO-TYPOGRAPHS.

M. Maudit's Shutter applied to Binocular Lenses.—At the interesting meeting of the Photographic Society of France, held on the 4th inst., the most striking feature was the adaptation of M. Maudit's shutter, with piston, to stereoscopic lenses. The piston, placed between the two objectives, is worked by two little jointed levers, which both sink at the same moment, causing the piston to allow the slides of the drop shutter to fall at the same moment.

Effect of Starch in Emulsion.—M. Audra, seeking to increase the sensitiveness of gelatino-bromide emulsion, has tried the effect of introducing starch. He has not attained the desired result, but proofs printed on the emulsion with the addition of starchy matter have all the character of prints on ground glass. No doubt M. Audra will be able to make some practical use of this effect produced.

Drying Box for Plates.—M. Roger, director of photographic works to the Minister of War, has invented a drying-box for gelatine plates. It is an arrangement of grooved rails sliding over one another, the points of contact with the plates being entirely of glass. A suitable ventilation from the bottom to the top allows of the plates drying in seven or eight hours. Plates of various sizes may be dried in the same drying-box by the ingenious arrangement of sliding into grooves.

Medical Photographs.—Dr. Richer and M. A. Londe have produced some remarkable medical photographs by the photo-electric apparatus previously described—the same subject having been reproduced successively at regular intervals, more or less frequent, at the will of the operator.

M. Chalot's Direct Life-size Print.—M. Chalot, the able successor to M. Franck, has shown a life-size portrait of a man taken direct with a Darlot lens three inches in diameter. The photograph is 45 by 60 centimetres in dimension. The exposure was forty seconds on a gelatine plate at a focal distance of 112 centimetres, taken by a light of medium intensity. The picture is mounted on a very firm black mount, with gilt bevelled edges, and the effect of the whole is admirable.

Use of Diachylon Plaister.—During the meeting I showed an improvement in the use of diachylon plaister for supporting pellicles. The sticky side of the plaister is applied to the wooden, celluloid, or metal slide, and firmly pressed down so as to exclude all air-bubbles The tissue is then wetted, and with care separated from the waxed surface, which, adhering to the slide, is ready to receive the pellicle, applied by pressing it down, a piece of clean paper intervening between it and the hand. After exposure, the pellicle is easily detached without loosening the sticky surface, which may be used several times with care. I next developed and fixed one of M. Stebbing's pellicles in a full light. I commenced operations by introducing the pellicle into the ferrous oxalate bath, with exposure to light. The exposed pellicle was contained between two slips of blackened celluloid, tinfoil being glued round the edges of one and folded over the other. The whole thing is plunged into the developer, and the tinfoil unfolded. The operations of developing, fixing, and washing took place in pocket-dishes made of calico coated with celluloid varnish, the liquids being afterwards returned to their respective bottles by means of pocket-funnels of the same materials. The pellicle, increased in size by one quarter, was taken from the water, placed between blotting-paper, fixed on a glass plate, dried, and finally coated with a film of normal

collodion, and, when the one side was dry, cut off the plate, and the film spread over the under side.

Herr Meisenbach's Photo-typographs.—Some beautiful photo-typographs, by Herr Meisenbach, of Munich, were greatly admired by all present. They show great progress on the part of the inventor; some portraits, especially one of Sarah Bernhardt, of which a remarkable example has appeared recently in the NEWS, show a delightful softness in the half-tints. These pictures do credit to Herr Meisenbach, and it does not concern us here to discuss who claims the priority of this application; therefore we hail with joy the most perfect specimens of the process which have come to our knowledge. LEON VIDAL.

Notes.

A New Year's wish: That our readers will try a combination of orange glass and ground glass in their developing rooms, and that it will serve to lighten their labours.

We are happy to announce that our colleague, Dr. J. M. Eder, of Vienna, has been awarded the silver medal of progress by the Photographic Society.

It may interest some of our readers to know that the illustration which forms the frontispiece of the last volume of the *Graphic*, and which is issued with the last number, is drawn from an instantaneous photograph by Mr. J. J. Acworth. The picture represents the pigeons of the Piazzi of St. Mark being fed by three fair and graceful young ladies.

The Photographic Congress, to be held this year at Brussels, under the protection of the King of the Belgians, is receiving a good deal of attention by Russian photographers. A committee has been appointed to consider what subjects should be put before the Congress, and so much importance does the St. Petersburg Society attach to it, that for president of this committee has been chosen a general officer who but a few years ago held the portfolio of Minister of the Interior.

The chief aim of the Congress, as our readers know, is to bring about unity in the matter of photographic sizes, forms, and formulæ expressions, as also in the matter of names and terms, so that one process—like collotype, for example—shall not be called by a dozen different titles. One thing our Russian friends seem to favour is the adoption of the English whole-plate and half-plate sizes, in place of the French, as the former lend themselves more economically to studio work. The invitation to English photographers to take part in the Congress will reach this country through the Foreign Office.

Some time ago the *Graphic* instituted a Gallery of Beauties, which was contributed to by such men as Millais, Leslie, and other Royal Academicians. These artists were each asked to paint a picture which should represent their idea of feminine beauty, and in this way various types were brought together, with which the public have from time to time been made familiar. Something of the same kind might be done in photography, and an excellent plan would be for some of our societies who get up exhibitions to offer medals for the best beauty types exhibited on their walls.

It is not at all improbable that Herr Haensel's photographs of lightning may serve to explain certain phenomena which have been placed on record in regard to persons who have been struck by what the newspaper reporter is fond of calling the "electric fluid." There are many well-authenticated instances of the tree-like impressions having been developed on the body after the latter had been struck by a lightning-flash. The narrators have in each case called the impression a representation of some tree near which the person struck had been standing, and naturally so, because the zigzag path of a lightning-flash as we see it in no way resembles a tree. But photography has a knack of upsetting conventional notions, and so it has in this case. Herr Haensel's photograph, given in our last issue, has distinctly a tree-like appearance.

To artists whose talent lies in freedom of style and rapidity of execution, photography must prove a welcome boon. Miss Thackeray, writing of her father as an artist, says: "The hours which he spent upon his drawing-blocks and sketch-books brought no fatigue or weariness; they were of endless interest and amusement to him, and rested him when he was tired. It was only when he came to etch upon steel, or to draw for the engraver upon wood, that he complained of effort and want of ease; and we used often to wish that his drawings could be given as they were first made without the various transmigrations of wood and steel and engraver's toil and printer's ink." This facsimile reproduction is now a thing of every-day occurrence, though much more common in the American illustrated periodicals than in English. Unfettered by the conventionalities of treatment which drawing on wood imposes, the artist can indulge his fancy, and attempt effects quite impossible in the old days.

The experiment of a daily illustrated paper has failed in New York. The affairs of the *New York Daily Graphic* are now being wound up, its liabilities being 779,500 dols., and assets only 140,000 dols. The *Graphic* made use of photography in the production of its pictures, and had a photographic editor on the staff. Practically, however, the outcome was not startling, the major part of the illustrations being taken from electros of blocks in the European illustrated papers. A process which will readily transfer from the negative, and will stand the wear and tear of a newspaper printing machine, not particularly good paper, and the carelessness of machine operations, has yet to be devised.

The late M. Gambetta was a photograph hunter. It is said that when he went to Rome, he made a collection of the photographs of all the cardinals, and picked out the photograph of Cardinal Pecci, saying, "That is the man who will be Pope"—a tribute to the truthfulness of photography, as all students of physiognomy will allow.

The *Globe* complains of the shabbiness of the Gambetta demonstration, and, by way of justifying the assertion, remarks: "M. Spuller made a speech, and a photographer read a poem." Why the presence of a photographer—the *Globe* did not think it necessary to give his name, although the *Times* did—should add shabbiness to a demonstration, our contemporary did not explain.

M. Ferrand, of Lyons, an expert in hand-writing, has continued his experiments touching the scrutiny, by means of photography, of ink marks, whether in the form of caligraphy or blots. His first success was in a criminal case in which a certain No. was illegible because of a big blot upon it; it was a question of tracing a bill of 50,000 francs, and this blot had been designedly dropped over the verifying No. M. Ferrand, by having recourse to photography, proved the No. underneath to be 1,200, which had been converted into 1,203 and then blotted. The No. was read more plainly in the negative than in the print; but still it could not be mistaken.

From the United States comes also a story of detection by photography. A New York merchant was accused of having falsified certain documents in recovering a fire assurance. Nothing definite could be proved against him until a blotting-pad was examined. This had no suspicious ink marks, but one sheet bore impressions as if it had been underneath a paper upon which somebody had scribbled with pencil. An expert conceived the idea of photographing the sheet with the indented marks. The electric light was employed, and a gelatino-bromide plate, with a result truly surprising. The whole of the calculations and all the fraudulent figures were reproduced as if they had been in the clearest handwriting.

M. Henri Becquerel has made a most quaint experiment. It is well known to many photographers that the phosphorescent paint, with which we are all familiar, after being excited by light, may have its glow extinguished by red rays, whether these red rays come through red glass, or are represented by the red end of the spectrum Further, it has been found that not only the red region of the spectrum, but the region beyond that, which is dark, acts in the same way, and is also capable of extinguishing the phosphorescence. The red region of the spectrum, and the so-called infra-red region, have already been investigated by photography, and now M. Becquerel has made a thorough research into the darkness beyond the red, by observing its behaviour upon a phospheresceut body.

M. Becquerel's singular result is this. He has found that in the perfectly dark part of the spectrum there are intense lines, just as in the ordinary visible spectrum there are vivid lines. These lines—in a perfectly black region, remember—he is able to record upon his phosphorescent tablet, incandescent sodium vapour, for example, producing two well-marked dark bands upon his plate. Of these, the photo-observer, no less than the ordiuary optical observer, had hitherto no knowledge.

As the infra-red rays of the spectrum have but a very weak action upon a bromide film, a modification of Becquerel's process might possibly be applied to photographically record the lines in this region. That is to say, after the phosphorescent tablet has been impressed in the above manner, by the intense lines extinguishing the phosphorescence, the tablet, brought face to face with a bromide film, would print off the intense bands on the latter, and thus the fleeting results on the phosphorescent tablet would be permanently fixed by photography.

Mr. Chesterman has been good enough to send us a Sunshine Record of St. Petersburg, issued, we believe, from the State Paper Department, where M. George Scamoni exercises control. In the Russian capital, as with us, November is a gloomy month; for only nineteen hours during a possible of 225 in that month did the sun favour our Russian friends with a visit. In June, however, they are very privileged, for there were 318 hours' sunshine out of a possible 555, which means that during every hour the sun was above the horizon, it shone for 34 minutes. Next to June is April, the sunniest month in St. Petersburg; while the average all the year round of sunshine is 21 minutes out of every possible hour.

Perhaps the best testimony to the value of the late Mr. Dallmeyer's services to science, was that borne by Professor Stokes, after lecturing before the Photographic Society in February, 1873. Mr. Dallmeyer, said the secretary of the Royal Society, had done more to reconcile theoretical and practical optical science than any man of his generation.

Captain Abney is good enough to call our attention to the circumstance that we printed "potassium" instead of "platinum" last week. He stated that the intensifying solution of the Platinotype Company contains chloride of platinum and mercuric chloride—not chloride of potassium.

We have already pointed out that bichromated gelatine, among other of its valuable attributes, is a capital cement for repairing broken articles of glass or china; indeed, one of these days it would be well to enumerate the many useful services it will serve. Not long ago a patent was taken out for waterproofing walls with a solution of bichromate and glue; while, mixed with a little glycerine, the mixture is sometimes employed as a substitute for marine glue.

By the way, although everybody is aware that bichromated gelatine was largely used in place of sausage skins during the Franco-German war for enveloping the well-known pea-sausages, it is not so generally known that the idea brought its suggestor, Dr. Jacobsen, of Berlin, a handsome fortune.

Patent Intelligence.

Applications for Provisional Protection.

319. SAMUEL DUNSEITH MCKELLEN, of 18, Brown Street, Manchester, Watch Manufacturer and Jeweller, for "Improvements in photographic cameras."—Dated 2nd January, 1884.

416. GEORGE DUNCAN MACDOUGALD, Chemist, of Dundee, in the county of Forfar, North Britain, for an invention for "Improvements in apparatus for storing, conveying, and applying developing and other chemicals required or suitable for the production of photographic pictures."—(Complete Specification). Dated 2nd January, 1884.

712. FREDERICK HAZELDINE, of Lant Street, Borough, in the county of Surrey, Contractor, for an invention for "Improved apparatus for use in washing photographic prints and other articles or materials."—(Complete Specification).—Dated 4th January, 1884.

CHAPTERS ON LANDSCAPE.

BY H. P. ROBINSON.

No. 2.—What to Photograph.

"WHAT is beautiful must be decided by each man for himself, and at his peril," says an able writer. "There are some who maintain that all nature is beautiful. Fortunately, we can now disprove this monstrous position by our daily experience of photographs. Even if they were quite true in effect, form, or expression, they would often be more or less ugly. They are usually planned and made by men of some chemical knowledge, but tasteless, and entirely unacquainted with fine art. Consequently, the photographers unconsciously offer us the mean and ugly mixed up with some beauty."

The writer of course refers to unselected nature, or nature selected without intelligence. The photographer can have no claim to the proud title of "artist" if he is content to take things as they are. Art has been said to exist in all nature, and we have only to learn the art of seeing it pictorially, to reproduce it in our paintings and photographs. This is true enough as far as it goes, but it does not go far enough. *A work of art is a work of order*, and if the artist is to put the stamp of his own mind on his work, he must arrange, modify, and dispose of his materials so that they may appear in a more agreeable and beautiful manner than they would have assumed without his interference. In the field the artist may select the time of year, the time of day, the direction of light, the conditions of the weather—for which he has sometimes to exercise one of the greatest qualities of a photographer, patience—the point of sight, and to a great extent the arrangement of the masses. Figures may be introduced to join two masses of either light or dark together, and to give life and motion to the scene, scale to the parts, balance to the composition, and—it is only carrying the thing a little further—a house may be pulled down or a tree up-rooted. That this is not a fanciful statement, I may say here that I once employed two men a day in clearing a wood to afford access to a particular scene I wanted to photograph. In the studio, effects are still more under the control of the operator. The arrangement of light, the pose, backgrounds, accessories, and, if he is a master, he can also, within limits, control the expression of his sitter. In this chapter on "What to Photograph," however, we will forget the studio, and keep out in the fresh air.

In taking local views, art must, to some extent, be sacrificed to utility. It is not essential that a local view should be pictorial. If some picturesqueness can be secured, so much the better, but the object is to give a portrait of the place. If a castle is the object, it must be made to appear bold and prominent, and, above all things, clear. Atmospheric effect, so beautiful in other pictures, must not be allowed to interfere with the clearness of a local view. If a distant mountain comes in the scene, it must be made to look as large and prominent as possible. If a church is the subject, it is more to the purpose to show every porch and window than to get a good effect of light and shade. But my object in these chapters is to help the student to make a picture which may have a just claim to be called a work of art, and local views in their intention are more nearly allied to maps and plans. Nevertheless, a careful study of the rules of art will enable the photographer to improve these useful productions, and the very fact of representing them may add interest to a scene. As Browning says:—

> "For, don't you mark, we're made so that we love
> First when we see them painted, things we have passed
> Perhaps a hundred times, nor cared to see."

A local object need not be taken at its worst. The ugliest thing with which man has disfigured nature—a square block of stuccoed house—may have to be photographed; it may be the first hotel in the town, for instance, and an important local view. I have seen such an object taken squarely in a full light, when it would have been easy to get it in perspective by moving the camera a few feet. I purposely give a plain and bald example, that the effect may be more easily seen. The principle may be applied to most subjects.

Many photographers find it difficult, even in the most beautiful country, to find anything to photograph, whilst others cannot turn in any direction without seeing subjects for their art. The only difference is, that the first mentioned have learnt to see, and the others have not. Subjects, or the materials for subjects, abound everywhere; but the art of seeing them is a cultivated sense, and does not come by nature.

It is a great fallacy to suppose that all art, even very good art, is the work of what is vaguely called genius, except that genius which has been admirably defined as the capacity for taking infinite pains. I willingly admit that the greatest art is the product of inborn genius—added to labour—but there is very little work in any art that touches the highest point, and, therefore, little that is not the product of acquired talent.

The constituents of a picture are plentiful, but they have to be found and arranged. A picture may contain a vast amount of landscape material, without being in the strict sense of the word a picture. It may contain a sufficient number of facts to make up half-a-dozen pictures, without being one in itself. There must be something more than imitation. Imitation, merely, is not sufficient for art, though it is a great requisite, and, in photography especially, is a factor which must not be left out of the reckoning. It must never be lost sight of, although Ruskin says that the pleasure resulting from imitation is the most contemptible that can be derived from art. It is at once weak, indolent, and spurious art which breaks down the natural for the sake of the artificial; it is easily detected, and the trick exposed. At the same time, imitation is no more to art than grammar is to language. But imitation may be subordinated, even in our imitative art. Literal fact may give way to higher truth.

It has been the practice for photographers, especially the least experienced, to select fine scenes in nature for the purposes of their art; while simpler subjects, if properly treated, are much more likely to yield picturesque effects.

A collection of views of cities, or other famous places, will pass from the mind and be only remembered as a set of very fine photographs; while a few simple photographs of bits of country with a figure or two, well-posed and lighted, will dwell on the mind for years. Why is this? It may be explained in two words—"human interest." There is the interest in the figures themselves apart from the artist, then there is the interest in how the artist has done his work. Then, perhaps, the title will help, as it should do.

There is no scope for a title in a view, you can only call it by the name of the place it represents; but in pictures of incident, although the subject shown describes itself, the title is not unimportant. Some of the finest effects are those which consist of broad masses of light and shadow. Breadth of effect is one of the most pleasing qualities in art; it harmonizes everything, and will give beauty to the ugliest objects. A great deal may be done by selecting the time of day. A subject that may be flat and weak with the sun shining full on it in the morning, may have every element of the picturesque in the afternoon, with the sun shining from the side or behind the view. To select a view with the sun shining in the front of the lens was once thought to be most unorthodox. It used to be a direction to the young photographer to have the sun at the side of the view, perhaps a little in front. It is curious how we all run in grooves. It is only during the last few years that photographers have shown any disposition to throw off their trammels, and take their pictures where they found them so lighted as to be most conducive to pictorial effect. It is but recently that photographers have dared to try to be original, and then only after a good deal of "showing how."

In connection with the effect of lighting I have referred to, I think I may venture to allude to a picture of mine as an illustration without giving a sketch, as copies are in the hands of many of my readers, the picture having been distributed as a presentation print by the Photographic Society of Great Britain, and the same scene with some variations in the figures was selected for a like purpose by the Edinburgh Photographic Society. I refer to "Wayside Gossip." I had often considered this particular view as to its capabilities of affording a picture, and given it up as not containing sufficient interest. It was nearly south, and I had either seen it in the morning or the evening, when the light fell flatly upon it. But one day I passed the place at noon, and found it changed as if by magic—"the daily miracle of the sun"—into a most picturesque scene. The trees, formerly an uninteresting collection of stems and leaves, were transformed into broad masses of shadow, delicately tipped and outlined with silvery light. The foreground was a fine breadth of light. There was little thought required to decide where the figures ought to go. The spot on the lake-dam, where the two figures are seated, seemed to insist that some figures should be placed there. After one plate had been exposed it struck the photographer that a third figure would add variety and interest, and, perhaps, a title, so another model was added to the group—the standing figure resting on a stick—and a second plate exposed without moving the camera. If my reader has an opportunity of seeing a print of this picture, he will notice the almost stereoscopic effect of figures lighted in this manner. The standing figure in particular seems to come quite solid from the background. This is due, in a great measure, to the edging of light round the figure which this kind of lighting gives, and the gradation in that part of the landscape which forms the immediate background.

Gelatine plates practically open up a new world to the photographer. He can get at subjects that hitherto he could not approach, and he can depend upon securing them, whether nature is playing with thunderstorms or sunbeams, with considerable certainty. He is also in a much readier state to take a picture when called upon suddenly than the old process would allow. This should induce him to take advantage of what may be called the accidents of nature. Many of these accidental effects have never been well represented in photographs; such as a rain cloud, for example, or the weird effect of cloud shadows passing over hill and valley. Transient atmospheric effects are always worth securing; so also are animal studies. It would be impossible for a photographer to decide beforehand that he would do a picture of cows in a stream; but he should be ready to avail himself of such a chance if it should occur.

As another instance of accidental effects, I may mention that I have several times exposed a second plate on a view containing water, because, after the first had been exposed with the water still, a puff of wind had ruffled the lake in places, and added surface to the mirrored depths. Quick plates enable the photographer to see the beauty of these accidents of nature. In the olden time—say four or five years ago—a puff of wind would have been considered a nuisance.

HANDY METHOD FOR LONG AND SHORT FOCUS WITH FINE ADJUSTMENT.

BY THOMAS FOTHERGILL.

HAVING recently made a large camera for enlarging, to which I wanted a quick and ready method for long and short focus combining a fine adjustment, the result of considerable planning and scheming led me to hit upon the following plan. Doubtless many of your readers will at once recognize the article that suggested the idea—viz, the nut of the leading screw of the screw cutting lathe. Finding that now I have it in practice it meets all my requirements, and is everything I would desire, the thought struck me a rough sketch and description in the NEWS may be of service to others.

Diagram 1 is the supposed folding tail-board of

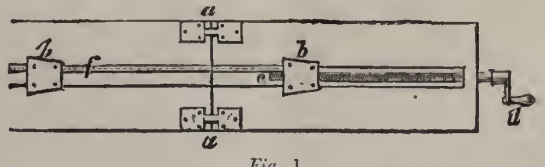


Fig. 1.

camera; *a a*, flush hinges for folding; *b b*, sloping brass plates fitting in receptacles in bottom of camera; *c*, fine double thread focussing screw. Diagram 2, a square nut

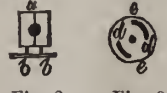


Fig. 2. *Fig.* 3.

cut in two, as marked at *a*, afterwards soft soldered, then tapped to screw (*c*, diagram 1), and separated by again heating. At the bottom of each half is a pin, *b b*, and these pins work in radial slots of a cam plate, as shown in diagram 3, *d d* and *e e*. It will be noticed that the points *d d* are much nearer the centre of plate than those of *e e*. To this cam (which with nut is enclosed) is fastened a handle, *f* (diagram 4), so that by turning this

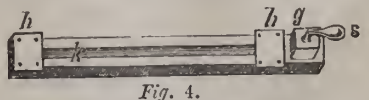


Fig. 4.

handle the points *b b* on nut (diagram 2) are forced from each other, and the pins, occupying the position of *d d* (diagram 3), are moved to *e e*, or *vice versa*, and the nut opened or shut; consequently the screw *c* (diagram 1) is liberated, allowing the camera to be freely moved either backward or forward. Diagram 4 is the under side of the piece of wood carrying the nut (which, with cam, is enclosed in a brass

box, *g*), and on the top of which are fastened the two plates, *b b* (diagram 1), for securing camera, which can be placed on either the one or the other. *h h*, plates of brass, slightly projecting to fit in groove, shown by dotted line, *f* (diagram 1); *k*, groove for focussing screw to work in.

Should any of your readers be tempted to adopt the idea, and fail to fully comprehend the detail, if he will write to me through the Editor, I should be glad to render him any assistance I can. A glance at a self-acting lathe will help to make my meaning clear.

A REALLY GOOD METHOD OF PRINTING IN CLOUDS.

BY W. CLEMENT WILLIAMS.

THE following method of printing in clouds will be found to be most reliable and simple in practice. For printing the landscape, take a piece of sensitized paper, rather broader than the negative to be printed from; this will enable us to afterwards balance the proportion of sky and foreground when cutting down the print, for it often happens there is too little sky, or too much foreground, or "more of a sort," than is advisable to retain. Place the negative and paper in a large size printing frame, so as to prevent the paper being crumpled where it projects beyond the limits of the negative. All the portions desired to remain white, for afterwards receiving the sky, must be carefully masked by throwing over the frame a velvet or other dark cloth, and folding so as to cause it to follow the outline of the horizon line of the negative underneath; small lead weights being placed at frequent intervals to keep all in proper shape. Up to this point, the only wrinkle introduced is the use of larger paper for modifying sky and foreground, the finished picture still remaining the same size as the original.

My "new idea" consists in dispensing altogether with black paper outline masks, and the frequent failures incidental thereto owing to abrupt joinings, while at the same time a perfect registration line is provided in its place to work to. With this parenthesis, we will return to the above picture in course of printing. Now take a piece of French chalk, and after sharpening to a point, sketch a horizon line, and follow the outline of the one before us, but a little lower down on the picture. This will be found to adhere to the glass firmly; it may be rubbed off with a dry cloth, and again become visible on breathing on it, and so a transparent guide mark is produced that will not in any way interfere with the printing by casting a shadow under it. This horizon line is not so essential in printing the landscape, but is absolutely necessary when the sky comes to be printed. In the present case, after the velvet shaded outline has printed a short time (in the shade, not sunlight) it is pushed a little towards the chalked line, and in a little while longer on the outline, then in the same way gradually back to the true horizon. When the landscape is sufficiently printed, it will be seen that the horizon is, if anything, very slightly vignetted, but this will be corrected when the sky is printed in.

Now take the sky negative in your hands, and bring the face of the print in contact with it, and hold up to the light to enable you to see how the horizon of the print cuts into the cloud forms; after sliding the print with the thumbs along the surface of the negative until the composition of cloud and landscape make the best picture, clip the same together with spring clips, and then with the French chalk pencil trace the horizon line of the print on the glass side of negative. To do this, you must again hold up to the light. Now place once more in a large printing frame, remove clips, and fasten up without in any way disturbing the relative positions of print and negative. On turning over the frame, the transparent chalk outline will denote where the velvet cloth should be placed for effectually masking the landscape, and a line sketched parallel to it with chalk as before will show how far to move the cloth during printing. This chalk line effectually takes the place of a correct mask and counter mask line; the velvet cloth and lead weight are a perfect mask, all edges being softened, which is not the case in any other method I have tried; it is an idea of my own, and I hope it may prove as successful in the hands of all who try it, as it has in mine.

SHEFFIELD PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE annual exhibition of photographs and apparatus in connection with this Society was opened this morning (January 7th) at the Cutlers' Hall, by the Mayor, Alderman Brittain. The pictures are over four hundred in number, and comprise specimens of all known processes, from different parts of the country. The photographs are carefully arranged, and include not only many fine foreign scenes, but charming views of local interest, and portraits of many prominent men. Perhaps the most finely treated work in the exhibition is one sent by Messrs Valentine and Sons, of Dundee—five snow scenes in the country, exquisitely done, showing, as they do, the trees delicately clothed in white, the frozen stream, and the lane down which there is just a suspicion of footsteps. The two pictures, "A May morning on the Wear," and "Nature's Mirror," exhibited by Messrs. M'Liesh, of Darlington, are fine examples of the gelatine dry process, and this firm send other two photographs of merit. "Miller's Dale," and "Bradgate Park, Leicestershire," are the titles of two silver prints of great softness, an effect produced by rendering them transparent and giving them a white background. These pictures are contributed by Mr. F. W. Broadhead, of Leicester, but the one of Miller's Dale is scarcely representative, for it reveals no limestone rocks, no gigantic Chee Tor. Messrs. Adam and Scanlan, of Southampton, send five portraits, different positions, of Sir W. Siemens, admirably done, and above these is an exceedingly clever photograph of the Bishop of Sodor and Man—an enlargement, an excellent likeness, by the Autotype Company, from one taken by Mr. G. Patterson, of Ramsey.

A number of studies of great ability are contributed by Mr. H. P. Robinson, of Tunbridge; one of them, "A Merry Tale," in which several country women have stopped in a field, and are laughing over some story, is very adroit in composition. A Chesterfield photographer—Mr. A. Seaman—exhibits a very large number of artistic pictures, some of which have historic interest. There is an attractive little photograph of the Revolution House at Whittington, where in 1688 the Earl of Devonshire and others plotted the revolution which ended in King James's overthrow. There are also views, exquisite for their detail and contrast, of Bolsover Castle, where Charles I. was feasted. But not the least valuable is the one showing Chesterfield Market Place on the day of the fair—the cattle, the farmers, and somewhat unsightly Market Hall, Glumangate Corner, High Street, are all got into the picture, which is very faithful and distinct. The Rufford Meet at Sutton Hall; Hardwick Inn, at the foot of the slope of the Marquis of Hartington's Derbyshire mansion; the pond and wooded bank at Tapton Grove, the bit of Westbar, and the church with the crooked steeple, are also capitally done by this artist. Mr. G. V. Yates, of Sheffield, sends several fine specimens of portraiture obtained by the gelatine process, and also a number of bromide enlargements, one particularly commendable—that of Dr. Atkins.

Mr. T. S. Hicks sends some nice enlargements; and Mr. Ainley contributes a case of portraits and some novelties—gaslight pictures on Morgan's paper. An admirable portrait of the ex-Mayor (Mr. Michael Hunter) taken by Messrs. Maule and Fox, is one of the exhibits; and not far from it are three careful enlargements on bromide paper by Mr. S. Foxon. Close by Mr. Taylor, the secretary of the Society, has on view two splendid views, showing the real character of Miller's Dale, with its pretty stream, varied foliage, and giant rocks. Just beyond, Mr. W. B. Hatfield, the treasurer of the Society, contributes several frames. In one of them is a delightful little picture of the village street at Bolsover, with the old-fashioned inn the Angel; and in others, amongst composition pictures, are three fascinating photographs of children bird-nesting and fishing. The scenes at Blackpool, too, giving a vivid idea of rough seas that are always dashing on the shore, are a credit to this exhibitor. A

frame of work sent by Mr. E. Peakowe, of Glossop Road, is distinguished for its detail and finish, the portraiture groups and interiors being alike good. The ex-president (Dr. T. H. Morton) sends a number of interesting views, mostly taken in India, and also a series of micrographs. The autotype enlargements representing cottage life, and sent by Mr. T. B. Blow, are also very attractive; and the same may be said of the splendid photographs sent by Messrs. G. West and Sons, which have taken no less than three gold medals. Mr. H. J. Palmer sends a valuable collection of views of Devonshire, Derbyshire, and Swiss Scenery; and Mr. W. Davies contributes a frame of Derbyshire scenes beautiful in manipulation. Messrs. Alfred Davy, M. Auty, T. S. Yeomans, E. Malcham, A. Chadburn, T. Firth, Dakin, J. H. Dickinson, W. England, also add materially to the beauty and completeness of the exhibition by their contributions. In the corridor of the hall is a large and important collection of apparatus.—*Sheffield Evening Star.*

PHOTO-LITHOGRAPHY AND PHOTO-ZINCOGRAPHY.

BY MAJOR J. WATERHOUSE, B.S.C.,
Assistant Surveyor-General of India.

CHAPTER XV.—ASPHALT PROCESS.—(*concluded*).

In some cases it is unnecessary to coat the plate with printing ink, but only to expose the plate covered with asphaltum to the light, then develop in turpentine, which, though it will not dissolve the asphaltum, will soften it and render it easily removed from a great part of the ground with a soft brush; the remainder can then be removed with the charcoal.

It may also be noted that M. de la Noë uses glass plates coated with asphaltum at about 12 per cent. for making negatives by contact printing from tracing.

Captain Biny, of the French Engineers, also attached to the Topographical Brigade at the Invalides, has described in the *Moniteur de la Photographie* for 1881 another method of engraving the zinc plates as follows:—

The bitumen image on the zinc plate being inked and gummed, the plate is passed rapidly into dilute nitric acid, and brushed with a soft brush to clean the surface. It is then well washed with water, and plunged, still wet, into a coppering bath, where it remains five or ten minutes. The zinc thus becomes coated with an *adherent* film of copper in all the parts unprotected by the bitumen. The heavy parts of the image become lighter and clear up under the action of the coppering bath. When the zinc is well covered with copper it is taken out of the bath, washed and dried, and then placed in a bath containing benzine, which removes the bitumen forming the image, leaving the clear zinc showing on the copper ground.

When the image has been thoroughly removed, the plate is washed with a strong jet of water to remove all the benzine, and is then rubbed with a cloth or a sponge in a tub of water. That done, and without wiping, the plate is placed in the same bath of weak nitric acid as was used for the cleaning, and it will be perceived that this only bites the zinc forming the image, leaving the copper untouched. In about fifty or sixty seconds a fine topogravure plate is produced, which is inked and worked just in the same way as described by M. de la Noë. In this process an ordinary reversed negative must be used instead of an original drawing or positive transpareucy.

For giving a very light coating of copper, Captain Biny uses the following coppering bath:—

Sat. sol. bichloride of copper ...	100 parts
Liquor ammonia	150 ,,
Water	3000 ,,

If a strong coating is required, he adds to the foregoing, which is of a beautiful blue colour, saturated solution of cyanide of potassium till the blue tint has nearly disappeared. The coppering is then slower, but nearly as firm as with the battery.

M. Mongel, the chief of the Photographic Ateliers of the Ministry of Public Works in Paris, has simplified M. de la Noë's process of topogravure, so as to avoid the second exposure to the light.

The zinc plate is first of all washed over with the preparation of gallic acid used for etching, or protecting the surface from printing ink. It is then thoroughly washed, dried, and coated with asphaltum. It is exposed to light under a drawing or a transparency, and developed in the usual way with turpentine.

After washing, the plate is treated with acetic acid diluted with four parts of water, which restores to the lines forming the image their faculty of receiving greasy ink. The plate is then washed and dried, and inked all over with the roller; the bitumen forming the reserves is washed away with benzole, and the plate is inked in again and is ready for printing.

The plate may, if desired, be bitten in with nitric acid at three per cent. as described by M. de la Noë. It is washed, treated with acetic acid, and the other operations follow as above described.

In trying this process with the usual zincographic etching fluid containing gum, the writer found it difficult to ensure the adherence of the bitumen over the gummy coating of the zinc, however well the latter might be washed. The simple decoction of nutgalls would probably be better.

Bitumen may also be used for photo-lithographic transfers, but, so far as the writer is aware, no process of the kind has come into general use.

A transfer process by Mr. Lewis, of Dublin, has already been noticed.

In 1863, Mr. Pouncy, of Dorchester, patented a tissue for this purpose, made by coating tracing paper with a mixture of printing ink, asphaltum, benzole, and fatty matter with or without bichromate of potash. The paper is exposed to light with the plain side under the negative, developed in turpentine, dried, and transferred to a damp cold stone.

M. Despaquis, of Paris, has proposed tissues made by coating sheets of gelatine with bitumen, a film of gum being interposed between the bitumen and its support, in order to facilitate the removal of the latter after transfer of the bitumen to stone or zinc. The print, having been exposed and developed, is laid, while still wet with turpentine, upon the stone, or, if it has been dried after development, it is moistened again with turpentine before being laid on the stone. A sheet of thick moist blotting-paper somewhat overlapping the print is placed upon it, and pressed down to drive off air-bubbles. One or two dry sheets of blotting-paper are placed over the wet one, and the whole is covered with a few sheets of glass. After the lapse of a few hours the dried sheets are removed. Water is applied with a sponge to the last sheet, and the gelatine being softened, the gum is dissolved and the film comes away, leaving the bitumen image on the stone. The gelatine has the advantage of transparency, and, being quite unaffected by the turpentine used in developing, does not extend, cockle, or warp. The method has the further advantage that the scale of the image is not altered in any way, either during the development of the image, or in transferring to stone or zinc. As several transfers can be joined up, the process is suitable for large work.

From the above and the previous chapter, it will be seen that the manipulations of the asphaltum processes are of the simplest nature, and when once the conditions of success are attained, exceedingly beautiful results can be secured with very little trouble. But the uncertain quality and properties of the material, even when purified by ether; the comparatively long exposure; the invisibility of the image; and the nicety required in developing to just the proper point, are difficulties which militate against the extended adoption of asphaltum in photo-lithographic work. Nevertheless, it is peculiarly suitable for the reproduction of very delicate line work, and will give very

much finer results than can be obtained by the ordinary collochromate processes, or even collotype.

The whole subject of the photographic working of asphaltum requires a much more thorough investigation than it has hitherto received; but it is to be hoped that as the interest in these processes is reviving, more attention will be given to the subject, and our knowledge of it be increased.

Correspondence.

THE CHARLES DICKENS ALBUM.

DEAR SIR,—Mr. A. R. Dresser, in last week's issue, makes an appeal to amateurs and others to assist in forming a collection of photographs illustrating the works of the late Mr. Charles Dickens—a good idea that should be carried out before the negatives that may already have been taken, fade, crack, or injure, in their several owners' plate-boxes.

I shall be happy to contribute four 12 by 10 clear and vigorous negatives of "Tom Tiddler's Ground" ("Mr. Mopes the Hermit"), and the "Maypole," "Chigwell Row," mentioned in "Barnaby Rudge."

If characters are to be included, they must of course be "properly made up." I would willingly undertake a share, or certain number of these, free from any expense.—I am, sir, yours truly,

RUBY D'OR.

HYDROKINONE DEVELOPER.

SIR,—Mr. St. John Biggs' failure with hydrokinone in the case of instantaneous exposures is probably due to insufficient development. Hydrokinone is a very slow developer, and from twenty to thirty minutes will probably be none too much time to give an "instantaneous." I have a couple of negatives taken on Nelson's extra rapid (20°), with an exposure of $\frac{1}{20}$ of a second, before me as I write. They were developed with the formula referred to by Mr. Biggs, and are so dense as to be practically unprintable these dark days. I may add that minute details of embroidery on a child's dress, the grain of the bricks in a red brick wall, and dark wood door behind the child, are given in these negatives with perfectly unnecessary sharpness. The lens was a cheap so-called aplanatic one of French manufacture, 6-inch focus, full aperture, autumnal light, about three o'clock in the afternoon of a fairly good character.—Your truly,

HENRY POCKLINGTON.

GREENISH-YELLOW LIGHT IN THE DARK-ROOM.

SIR,—In reply to Mr. Bradshaw's question as to whether I use the green-yellow light in my dark-room, I can only repeat what I stated at the meetings of the societies when I spoke upon the subject, that I had for some time past had my dark-room window fitted with green glass and deep yellow paper, and that it answered so well with me that several other dark-rooms had in consequence been similarly fitted, and that in every case the greatest satisfaction had been expressed.

Amongst other combinations, I tried one similar to that mentioned by Mr. Bradshaw, but did not find orange glass so safe as yellow paper in conjunction with green glass. It is, however, no doubt, as Mr. Bradshaw says, better than a ruby light, which would give the same amount of luminosity to the eye, and the value of his testimony in the matter will be appreciated by those who know how he insists upon technical excellence in his work.

I have been sometimes surprised by being asked whether I venture to use the kind of light that I advocate for preparing plates, or whether for that purpose I do not still use ruby light. As I have shown that for an equal amount of luminosity to the eye there is less chemical action on the plate with the green-yellow than with ruby light, I use the former as a matter of course in the preparation of plates, and I certainly think that my plates are clearer than they were when using the accustomed ruby.

It must be understood that I do not claim that the light I use is without chemical action, but if it and the ruby light are used of such intensity as each to afford a certain amount of light to work by, there is less action on the plate with the green-yellow than with the ruby.

To any photographer desirous of getting rid of the trying red light, and wishing to see the particular colours of glass and paper that have succeeded with me, I shall be happy to post patterns.—I am, yours obediently,

W. E. DEBENHAM.

Massingham House, Haverstock Hill, N.W.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

AT the ordinary meeting of this Society, held in the Gallery, 5A, Pall Mall East, on Tuesday, the 8th inst., Mr. J. GLAISHER F.R.S., President in the chair,

The minutes of the previous meeting having been read and confirmed, Messrs. A. G. Dew Smith, M.A., and A. Tagliaferro, were admitted members of the Society.

The PRESIDENT said it became his painful duty to announce to the meeting the news of the death of Mr. J. H. Dallmeyer, which is reported to have occurred on board a vessel within sight of the shores of New Zealand. Members and council, looking up with respect to Mr. Dallmeyer's opinions, all sympathized with his family in their great loss, which would not only be felt by them, but the Society, the optical world, and England.

Mr. G. L. ADDENBROOKE showed a folding lantern made of cardboard and bookbinders' cloth, and sufficiently high to burn an ordinary candle in; the colour emitted being red. The many advantages it possessed when travelling being his excuse for bringing it before the notice of the Society.

Mr. W. E. DEBENHAM: Has Mr. Addenbrooke tried any other medium than red? This colour having been found injurious to the eyesight, whereas a mixture of yellow and green would not be so. The mixture of yellow and green gives a better illumination, and is a much more pleasant light to work in.

Mr. ADDENBROOKE said the quantity of work he did not being large, he had not found the light injurious; he had not tried the mixed colours alluded to by Mr. Debenham.

The PRESIDENT observed that the lantern appeared to be of a practical nature, and they were always glad to have practical ideas placed before the Society. Mr. Spurge being present, the adjourned discussion on his paper would be resumed, and if anything new had cropped up since the paper was read, he should be glad if Mr. Spurge would let them know.

Mr. J. B. SPURGE replied that he had nothing to add to the paper. He passed round the several examples, showing the effect produced by 16 and 25-candle gas respectively, using Mr. Warnerke's sensitometer side by side with his own, the duration of exposure being varied from two seconds to 256 seconds. The standard light, being four of Mons. Giroud's standard gas burners, one mm. in diameter, arranged in a line parallel to the plane of the white screen, at a distance of 25 cm., the length of the flames being equal—that is, 67·5 mm., and regulated by two cross lines. Between the opening formed by the two jets near the centre the sensitometer is placed, and an exposure of sixty seconds was mentioned as a suitable exposure. The advantage claimed for this plan was that, being made from measurement, it could be made by anyone who possessed a foot rule.

Mr. DEBENHAM said elaborate mathematical calculations are very useful, and should be very exact. In this case there was uncertainty, a radical fault attached to all sensitometers. Plates exposed to extraneous light, or from other causes, may render the sensitometer reading sixteen times greater, without the plate being any faster in reality. The new point was the employment of the gas unit, and the question is, whether or not any advantage is gained over magnesium? Gas may vary from many causes; barometric pressure will change its power.

The PRESIDENT reminded the speaker that a governor being used, variation would not be likely to occur.

Mr. DEBENHAM, continuing, said it was a question whether gas burning continually at the aperture would not of itself make the

instrument uncertain; altogether, he considered it less certain than the Warnerke sensitometer.

Mr. T. Sebastian Davis had very little to add to the remarks of the previous speaker. In the present instance, they were considering the reliability of gas as a constant source of light, and in Mr. Warnerke's they had a given quantity of magnesium ribbon consumed. It being established that some batches of plates are more sensitive to the yellow and red rays than others, left room for inaccurary. Does the same ratio hold good between gas, magnesium, and daylight? He (Mr. Davis) could understand exposing plates of one make to the same source of light, the unit would then be reliable: but when we take into consideration the difference between it and camera exposures, there are so many chances of failing, that it could scarcely be considered a perfect standard.

Mr. Spurge, in replying, remarked that, supposing the plates to be fogged in preparation, or exposed to any extraneous light, the ratio of degrees would not be affected any more with gas than by the phosphorescent unit. The standard size of the gas jet was that of M. Giroud, of Paris, and a variation of 0·05 in the size of the hole would not affect the intensity more than 0·015; while the quality of the gas employed may vary thirty per cent. It would be seen, in the example marked I., two plates were exposed, side by side, to the gas flame and in the camera respectively, the ratio being 1 to 48. The objection regarding plates of varying composition holds good with the phosphorescent unit; but in the case of bromide and bromo-iodide, the variation may be overcome by having a constant for each class of plate. In his sensitometer there is no medium between the plate and source of light. All his experiments were conducted side by side with the phosphorescent unit. Gas poor in quality answered equally well, provided the line of measure be taken from the principal luminuous point, not the length of the flame.

The President announced that nominations must be sent in not later than Monday, January 21st.

The gentlemen appointed to act as auditors were:—Mr. G. L. Addenbrooke and Mr. C. Ray Woods. Scrutineers:—Messrs. W. K. Burton, W. Cobb, A. Cowan, and F. Hollyer.

The retiring officers are Captain Abney, F.R.S., vice-president; Mr. W. S. Bird, treasurer; Messrs. Bedford, Bolton, England, Dallmeyer, Mawdsley, and Captain Darwin.

South London Photographic Society.

The annual lantern meeting of this Society took place on Thursday evening, the 3rd inst., in the Hall of the Society of Arts, a large number of members and their friends being preseut. The chair was occupied by Mr. F. Howard, vice-president.

The Chairman, after remarking on the continued popularity of the annual gatherings of members and friends, inaugurated, like the Technical Meeting, by the South London Society, said there were not quite so many slides sent in this year as on some former occasions. He had no doubt some of the members had slides with them. Among those sent in he was pleased to announce contributions from Messrs. F. Beasley, Junr., F. A. Bridge, J. J. Briginshaw, W. Brooks, W. Cobb, J. Gale, H. Godbold, Hepworth, R. Trueman Wood, F. York, and others. Mr. Bridge had very kindly offered to give a brief description of the subjects, and Mr. Brooks had undertaken the duties at the lantern. Some music was also promised, and he thought an enjoyable evening would be spent.

Mr. F. A. Bridge said there were not so many slides as they usually had; he supposed several of the members had formed the same opinion—*i.e.*, every one else is sure to send slides. If all the members had entertained the same opiuion, the Society would have come poorly off. In case of a searcity, he had provided for such by bringing the series used to illustrate his lecture on Holland.

The first slides projected on the screen (a disc about twenty-five feet in diameter) were by Mr. Beasley, Junr., on gelatine plates toned with mercury. These were followed by Mr. H. Trueman Wood's series on gelatino-chloride plates of his own make.

Mr. Brooks then showed a very fine slide of the president, and another of Mr. Jabez Hughes, whereupon Mr. Bridge sang Mr. Hughes' version of the "Spider and the Fly," which caused much amusement.

A series of microscopic subjects by Mr. York; microscopic and landscape by Mr. J. J. Briginshaw on gelatino-chloride plates; views in Holland, taken by Mr. Bridge, and prepared on collodion emulsion (contact printing) by Mr. Brooks; also a series taken in Wales, and produced in the same manner by those gentlemen; Mr. Gale's series on wet collodion, Mr. Smith's by the Woodbury process, Mr. Hepworth's on gelatine bromide, Mr. Cobb's street views by the same process, Mr. W. Ayres' comic sketches on wet collodion, Mr. Wheeler's and Messrs. Bridge and Brooks' Holland collection, were all passed through the lantern. During a brief interval between each exhibitor's slides being shown, vocal music was admirably rendered by Miss Harrison, Mr. Page, and Mr. F. A. Bridge, the latter gentleman, as usual, presiding at the piano.

A vote of thanks to those ladies and gentleman who contributed to the evening's entertainment brought the proceedings to a close.

London and Provincial Photographic Association.

The usual meeting of this Society was held on Thursday, the 3rd inst., Mr. W. E. Debenham in the chair.

Mr. W. T. Wilkinson asked if any members had had experience in using an old pyro developer.

Mr. A. Mackie said that some time since he received about two ounces of an old pyro developer that had been kept twelve months, Mr. Cowan having previously developed eight plates with same. He (Mr. Mackie) developed half an exposed plate with this developer the plate being in the developer one hour and a quarter: the plate was not stained. The other half of plate he developed with a fresh solution in four minutes. He was of opinion that the old developer gave the best negative.

Mr. A. L. Henderson said about three years ago he had, as a matter of experiment, prepared a solution of pyro, ammonia, bromide, and free bromine. After keepiug it twelve months he had found it slow; he had still some left, with which he promised to make experiments, and report at a subsequent meeting.

Mr. Mackie, referring to a notice he had seen of Mr. Henderson's method of cleaning a gelatine plate by placing it over a solution of cyanide of potassium, said he had put a negative on the top of a bottle containing cyanide for some days without effect.

Mr. Henderson said he had noticed an account of Mr. Spiller's experiments in this direction in the News Almanac. He accounted for the slowness alluded to, that sufficient free air had probably not been allowed between the cyanide and plate. In Mr. Mackie's case he observed that the plate should have been soaked first in water.

Mr. Wilkinson, in reference to a remark as to the best means of removing silver stains from a negative caused by damp silver paper, said he had found a solution of two ounces nitric acid and five ounces of saturated solution of alum quite clear a plate of any stain from this cause.

In reference to this subject of stained negatives, Mr. Henderson remarked that the bleaching action of hydrochloric acid and alum on a gelatine plate taken direct from the fixing bath without washing, was much greater than if washed first. He attributed this to the sulphurous acid liberated acting in conjunction with the hydrochloric.

Mr. F. Parsons showed a finder for a large camera, constructed to view the object from the side; it was a box about two inches square, with a small lens in front to focus with, a mirror fixed obliquely inside throwing the reflection on to a glass screen, forming a small camera-obscura, a japanned tin projector shading the screen.

Photographers' Benevolent Association.

The Board of Management held its monthly meeting on 3nd inst., at 181, Aldersgate Street.

The minutes of the previous meeting were read and confirmed.

Messrs. Carroll, Dugdale, Cotrell, Dubbin, Logan, and Wilkinson were elected members of the Association.

It was then decided that the annual general meeting should be held on Wednesday, January 30th, at 181, Aldersgate Street, at 8 p.m. All members who can attend are requested to do so, and members of the profession are earnestly invited.

Talk in the Studio.

Spectrum Research—M. Henri Becquerel has been pursuing his researches upon the infra-red rays of the spectrum. For the investigation of this region there are four methods, the first of them involving the use of a line-thermopile and a rock-salt prism;

the second, Abney's photographic method ; the third, Langley's method, with bolometer and a reflecting diffraction gratiug; the fourth, that of Becquerel, depending upon the discovery that the infra-rays have the effect of extinguishing the glow of a phosphorescent body exposed previously to ultra-violet rays. M. Becquerel finds that water, for example, gives in the region to which this method is applicable three well marked absorption-bands, having wave-lengths respectively of 930, 1,080, and 1,230. The newest result of Becquerel's researches is worth more than passing mention. He fiuds that there exist in this wholly invisible region of the spectrum bright-line spectra—equally invisible, of course—just as in the visible parts of the spectrum, observable in the radiations of hot vapours. Thus, incandescent sodium vapour prints upon the previously "insolated" phosphorescent substance two well-marked lines (wave-leugths 819 and 1093), corresponding to two bright lines hitherto unknown. The extent of the region which is capable of being explored by this novel process is from wave-length 760 to 1,300, or exceeding in extent that of the whole of the visible and ultra-violet rays.

ESTIMATION OF CHLORINE, BROMINE, AND IODINE IN PRESENCE OF ONE ANOTHER.—Mr. F. Maxwell-Lyte, referring to the recent paper of Paul Julius on the "Decomposition of Silver Chloride by Bromine, and of Silver Bromine by Iodine."—Doubtless these experiments were made by him with a view to the separation of chlorine, bromine, and iodine from one another. In this connection the following will be found a convenient method :—The haloids having been precipitated together with silver, the precipitate is to be collected, dried, aud weighed. It is now dissolved in about thirty or forty times its weight of water by the addition of the least possible quantity of cyanide of potassium. A quantity of pure bromide of potassinm is now added, which need not be above the weight of the precipitate. The cyanide is now decomposed by the addition of au excess of dilute sulphuric acid. The precipitate, in which any silver chloride has become by this means converted into silver bromide, is now collected on a filter, dried, and weighed. It is once more dissolved by the least possible quantity of potassium cyanide, aud the same quantity of water, and to this is now added one and a-quarter times the origiual weight of the precipitate of potassium iodide. The cyanide is now again decomposed by dilnte sulphuric acid, and the precipitate once more collected on a filter, dried, and weighed. In this last precipitate all the silver is converted into iodide, excepting such as was iodide already. In the second experiment all became bromide, exceptiug such as was bromide or iodide already. From the weights then obtained from the first, second, and third weighings, the chlorine, bromine, and iodine may easily be calculated. I use this plan, dissolving in cyanide, as I find sometimes that the soluble iodide or bromide may not suffice to decompose completely the bromide or iodide respectively. The cyanide used may be the ordinary commercial cyanide, *providing always*, as is usually the case, it be free from iodide.

PHOTOGRAPHIC CLUB.—At the next meeting, on Wednesday, January 16, the subject for discussion will be "On Gelatine Plates for Lantern Slides Camera for Exposures."

To Correspondents.

*** We cannot undertake to return rejected communications.

C. R. B. D.—It is intended that a glazed tile should be used, and the softening of this glaze is sufficient. If, however, an unglazed tile is employed, the following will serve your purpose ; it must be poured on over the picture before it is fired.

Cornish stone	40 parts
Borax	5 ,,
Soda carbonate	5 ,,
White lead	75 ,,
Flint glass	10 ,,
Flint	23 ,,

Fuse these together, and grind with water until a creamy liquid is obtained.

F. W. VOLKMAR.—Both are excellent instruments, and, indeed, so similar, that it is not possible to recommend either as superior to the other.

A. B.—Try Mr. Plener's plan of immersing the plates in a very dilute hydrofluoric acid—a few drops to each ounce of water. When the film is off the glass, squeegee it on a waxed glass plate to dry ; it will separate easily from this.

PHOTO.—If proper steps have been taken to protect the designs you refer to, you will certainly incur considerable risk in reproducing them as you propose ; if, however, you have no wish to make a profit out of the copies, it is not unlikely that the proprietors would give you permission to reproduce. 2. It is protected, and it makes no difference whether your copy is larger or smaller than the original. You do not seem to clearly perceive that you have no more right to appropriate the whole or any part of a work of art belonging to another, than you have to take the whole or a part of the cash stored in your neighbour's strong box.

S. PORTER.—If your paper is kept in a moderately damp place, so that it shall not be too dry when floated on the sensitizing bath, it is very likely that you will not experience the difficulty again.

ARTHUR STANLEY.—As regards the Stannotype, you should write to Messrs. Woodbury, Treadaway, & Co., of Manor Road, Lower Norwood.

J. H. LEWIS.—We have, as you requested, sent you the address on a post-card.

EDWIN GRANT.—1. Under such circumstances one would call 160 high. 2. We do not quite understand your question.

J. BERRYMAN.—There is a descrepancy, and we will make enquiries.

GEORGE PERRY.—A trifle over thirty grains.

A SUBSCRIBER.—Hang them on small screw eyes, fastened into the sash-bars.

R. P. GEGSON.—We are not aware that it is made commercially ; but our description is sufficiently detailed to enable a workman to construct the apparatus.

G——— & Co.—We have given you all the information in our power by post, but should advise you to construct it for yourselves.

BISMUTH.—The following melts at the temperature you mention :—

Cadmium	1 part
Tin	2 parts
Lead	4 ,,
Bismuth	7 ,,

D. G. A.—1. The reproductions can be made by the ordinary zinc transfer process. 2. Intaglio plates for printing suitable grains, can be purchased from Messrs. Hughes and Kimber, of West Harding Street, Fetter Lane, London.

DR. SCHLEUSSNER.—We have posted you a number of the PHOTOGRAPHIC NEWS containing the description, and imagine you will have no difficulty in constructing the machine.

A. S. HOPKINS.—We have never experienced any difficulty in obtaining it at a leather-seller's.

The Photographic News Registry.

Employment Wanted.

Operator, dry plate manufacturer.—J. R. H., 11, Lewisham High-rd., S.E.
Operator, retoucher, all round.—Mr. Ems, 12, Bartholomew-ter., Exeter.
Reception Room, book-keeper, &c.—M. R., 34, High-st., Sittinghourne.
Lady, to mount, spot, &c.—A.S., 3, Silchester-rd., St. Leonards-on-Sea.
Retoucher, can operate.—H. A. G., 35, Brooker st., Hove, Brighton.
Retoucher, operator, or manager.—J. Jones, 79, Euston-st., Euston-rd.
Operator, gen. assist., good all-round.—T. W. 59, Tredegar-rd., E.
Retoucher and assist. operator.—A. R., 27, Cross-st., Ryde, I. W.
Salesman to photo. & frame makers.—L. W., 18, Plantation-rd, Oxford.
Operator, colourist, &c.—S. George, Sherwood-villa, Brunswick-pk., N.
Neg. Retoucher, lady.—M. F., Gaskell's, 15, Sussex-rd., S. Kensington.
Reception-Room or Shop.—C. M., 2, Dover-ter., Dover-st., Sittingbourne.
Retoucher, Lady, first-class.—E. M., *Photo. News* Office.
Spotter & Mounter.—Miss Stewart, 2, Albany-ter., Bournemouth.
Retoucher & Spotter.—L. F., 30, Swanmore-rd., Isle-of-Wight.
Silver Printer, first-class.—F. G., *Photo. News* Office.
Reception-Room, Lady.—F. W., 16, Chryssell-rd., Brixton.
Retoucher (Lond. only), c/o. J. S. Cockerton, 2, Hanover-pl., Regent's-pk.
Retoucher & Assistant Operator.—Artist, 19, Waterloo-st., Southsea, Hants

Employment Offered.

Artist for carbon enlargements, &c.—C. F. Treble & Co., 371a, Brixton-rd.
Silver Printer, quick & experienced.—C. F. Treble & Co., 371a, Brixton-rd
Lady, exp., for mounting & spotting.—Mr. Gandy, 5, Bishopsgate-without.
Printer, artistic vignetter.—E. D. Lavender, Tweedy-bldgs., Bromley, Kent.
Artist for monochrome, carbon enlargements, &c.—Lex, *Photo. News* Office.
Miniature Painter, first-class.—Lex, *Photo. News* Office.
Fitters, artificial light apparatus.—Luxograph Co., North-end, Croydon.
Learner, for retouch.—N. M., c/o. Shew & Co., Wardour-st., Oxford-st., W.
Operator, first-class, & to retouch.—Hodson, 8, Market-pl, Retford.
Enlarger for general work.—D. S., *Photo. News* Office.
Dry-plate man, first-class.—Dry plate, 37, Thornton-st., Brixton.
Operator and retoucher.—F. Baum, c/o Disderi & Co, 4, Brook-st., W.
Female Assistant Printer.—F. Baum, c/o Disderi & Co., 4, Brook-st., W.
Painter in Oils, Club work.—K., *Photo. News* Office.
Printer & Toner, good Vignetter.—Mr. Vanderweyde, 182, Regent-st., W.
Photo-litho. Oper. (transfers, collotypes,).—Stewart, *Photo. News* Office.
Lady, Youth, and Apprentices.—2, The Pavement, Clapham Common.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

THE ELECTRIC SPARK CONSIDERED AS A STANDARD LIGHT.

To the modern photographer some system of photometry or actinometry has become almost an imperative necessity, and already several rival methods have made their appearance, the merits of which entitle them, more or less, to scientific consideration and respect.

It must be conceded that any system to be reliable (and therefore practically perfect) must embody a *constant*, and undoubtedly that constant should be the acting property —the *light*. It is no part of our object to detract from the merits of any system which has so far obtained publicity; our aim is to improve thereon; and whilst we give every credit to the manifest skill and ingenuity of their proposers, we take the liberty of contrasting or comparing their systems with the one we are now about to advance; our apology will be in our earnest desire to advance science, and especially photometry.

We have often considered whether out of electrical laws there could not be formulated a *light* standard which should be capable of being copied or set up in any part of the world, and which could be spoken of in terms of figures signifying unity, just as in electrical science there are units or constants. No one who has experimented with electrical machines, such as the old type of frictional cylinder or plate machines, can fail to have been struck with the intense luminosity of the sparks drawn therefrom; but frictional machines are too complicated for our present purpose, and are, indeed, superseded by the more modern machines, called induction machines, such as that of Holtz, or the more recent invention of Voss. We will not now stop to study the principle and functions of these machines, but will at once point out that the discharge or spark between the terminals of the Voss machine conveyed to our minds the belief that a constant could be calculated therefrom, and we proceeded to reduce it to practice.

It must be understood that no claim is laid to novelty in the use of electric sparks in connection with photography—that has been done years and years ago—the claim we shall now advance is in utilizing the sparks from the Voss induction electric machines as a *standard* unit of light, and we will proceed to show how this is done. A second article will treat of the machine, its construction, principles of action, its convenience of use, the laws which apply to bear out the theory of a constant or unit, and the methods of using the machine for the purposes of our subject, together with suggestions for simplifying the arrangements of the machine, so as to express in figures the conditions for a definite standard.

If we take a Voss machine, and revolve the plate in a darkened room, and as soon as a manifestation of electrical disturbance is visible, we approach the knobs of the discharger to about an inch apart, we shall notice bright straight sparks leaping across, accompanied by a snapping sound. One cannot fail to notice the apparent similarity of the sparks as they fly in quick succession from knob to knob; in the darkened room their illuminating effect upon the walls and surroundings has the appearance of even greater regularity than when we look at the spark itself, for the eye is liable to error by becoming fatigued or habituated to a dazzling light. If we turn the handle of the machine so as to get *one hundred* sparks with the balls or knobs of the discharger set at one inch apart, we get a quantity of light of an actinic character, which our photometric experiments lead us to believe is a reliable *standard*—a standard light.

There are conditions that *may* interfere with the accuracy of such a standard; we say *may* interfere just in the same sense as there are conditions that may interfere with the correct performance of the most perfectly made chronometer, or any other piece of machanism; but the disturbing conditions are such as are not fatal to the system, nor are they so serious as those which appertain to the employment of gas or other combustible illuminants, or the use of the excited tablet of phosphorescent sulphide of calcium —*alias*, luminous paint. We shall compare these things by-and-bye.

The whole of the following experiments were conducted in the dark room, and may be repeated without leaving that apartment. The "screen" employed was the nearest thing that happened to be at hand, viz., the screen of a Warnerke's sensitometer, and for the present purpose serves well enough to illustrate our remarks, because it enables us to express by *its figures* the results obtained by the system we are now discussing. But after we have established the fact of the standard light, we shall proceed to draw further attention to the standard sulphur light screen, which was first suggested in these columns. If our readers will refer to page 38 of the volume for 1881 they will find details as to the only standard light screen or sensitometer scale yet proposed, the gradations being obtained by varying thicknesses of the element sulphur.

A standard light and a standard screen would not be perfect unless we used a standard or normal developer. Accordingly we performed all our experiments with a developing solution compounded as follows:—

Pyrogallic acid	1 grain
Bromide of potassium	1 „
Ammonia (·880)	2 minims
Water	1 ounce

We preferred to use the ammonia and bromide dissolved in the water by taking 60 minims of ammonia and 30 grains of bromide and dissolving in 30 ounces of water; this sufficed for thirty experiments.

Taking from a box of plates of our own make (and whose sensitiveness was such as to entitle them to the term "rapid") one plate 6½ by 4¼ was cut into two quarter-plates; we next cut them in twain, and had thus four pieces from the same plate to experiment upon. Placing the "screen" of Warnerke's sensitometer in the usual quarter-plate printing frame, we put thereon one piece of the cut plate, closed the frame as usual, and, first covering the glass side with a piece of black cardboard, we took it to the Voss machine, which stood on the bench not very far from our developing table, and which is also near to the stove which warms the laboratory. Placing the frame glass side up, and still covered by the black card, on the base board of the machine between the two little jars which support the discharger, it is exactly six inches from the face of the screen to the axis of the spark between the knobs. Then we turn the handle of the machine; it soon "takes," in electrical parlance, and sparks fly between the inch-separated knobs; we now withdraw the black card and count a hundred sparks, and then stop. It will thus be borne in mind that we expose the sensitive plate beneath the screen to a hundred sparks one inch long at a distance of six inches.

We now proceed to develop with the standard developer just named. The impression quickly appears, and we see the first two columns of figures, from No. 1 to No. 10, quite distinctly within one minute, and then we observe the other numbers coming up in the third column and indications of those in the fourth, until developing action seems to stick at the ghost of 17 or 18. These results correspond pretty closely with the figures revealed by the careful use of Warnerke's system with luminous tablet; hence we prefer for the present to adhere to the hundred sparks one inch long at six inches distance, and for other reasons which we will indicate further on.

Our next experiment was with the piece of the same plate from the opposite diagonal corner, and, therefore, somewhat unequal in thickness of the coating of gelatino-bromide of silver. We proceeded with this exactly as before described, and on developing we obtained indentically the same figures and general characteristics as in the first experiment, the only slight difference being attributable to the thick ridge of the film at the pouring-off corner of the plate. To settle any question as to the doubt of the constancy of our light, we had the remaining two pieces of the plate to fall back upon, and to eliminate any possible error due to variations in the energy of separate developers we exposed the remaining two pieces of the plate one after the other, and developed them in one dish together, with one ounce of the normal developer. The two developed exactly alike, they started together, and the figures became visible with such identically similar density that the conviction is forced upon us that, within reasonable bounds and under ordinary conditions, this light is a constant, an unit, and a standard of most reliable nature.

Yet, to make assurance doubly sure, we determined upon further experiments. We preferred to employ *known* plates—known in the sense that their make, history, and sensitiveness are familiar to us, not that we would like to flatter ourselves into the belief that because such and such a plate was quick and another was slow, so the electrical standard light should prove it, but rather that we should take the evidence furnished by the system *first*, and then, knowing the speed of the plates, to sum up and return the verdict "proven." We therefore took down a totally different make of plate, and proceeded in the manner indicated in the foregoing, and every time with the like result. The second set of experiments were with plates which were slow, and whose behaviour under the developer after camera exposures was very different from that of the first lot of plates; their behaviour under our standard light system in every respect convinced us of the superiority of the electrical discharge light, as compared with the phosphorescent tablet. The experiments were repeated over and over again with unvarying results—results which we might have led ourselves to *expect* when we reduce a system to simplicity, to eliminate grand errors, and minimise small ones.

Before we proceed further we had better explain why we advocate pyro. as a normal developer, and why we give the proportion of bromide so high. Ferrous developers are very useful, but their energy depends too much upon temperature, the degree of saturation of the components, and the purity of the oxalate used. Photometric experiments are worthless if not clear, exact, and precise. Fog on a gelatine plate can so help the photometric image as to make it really misleading; therefore the formula for the normal developer embodies an amount of bromide sufficient to keep most plates clean under development, so that the figures or ghosts of figures may be clearly made out.

Given, a standard light, a standard screen, and a normal developer, development by time might appear to be the only other condition necessary to assess the sensitiveness of a given plate; but this is not so. It is notorious that some plates will flash out under the developer and are done; others are slow to start and sluggish in arriving at the end, and yet their sensitiveness and quality may be equal to those of the first named. Therefore we fear we cannot at present advocate developing by time, but rather leave it to be pursued as is usual when plates are under treatment for obtaining as much detail as the exposure will give, stopping the action of development when fog threatens to set in. This is very easy in photometric development, for there is generally a space of clean bromide along one edge of the plate, whose integrity is a guide to the duration of development.

Now of all the standards of light proposed, probably daylight would be the worst, gas-light next, the standard candle next; the phosphorescent tablet has its merits, but is far from being entitled to be called a standard, because not one inch nor one foot of magnesium wire can saturate a tablet with light as compared with sun-light; then, again, its rapid decline during the first minute is a serious disturbing element, to say nothing of the effect of varying temperatures, which are known to alter the light given off an excited surface of phosphorescent sulphide of calcium. The material, too, is, as we well know, too variable in its very make to entitle it to be reckoned as a constant article.

In the electrical discharge system, as typified in the Voss machine, the disturbing elements are, the condition of the air through which the spark passes, and the storage capacity of the condensers (two small Leyden jars), and the material of which the knobs of the discharger are made. These will be treated of in our next article; meanwhile, any Voss machine may, under ordinary conditions, be considered as a standard in relation to itself, if not to others of similar make.

SILVER PRINTING.

THE DISCUSSION ON MR. ASHMAN'S LECTURE.

THE lecture lately given by Mr. Ashman at the London and Provincial Photographic Association was in itself very instructive, and was rendered even more so by the discussion which followed. Fortunately, there were present several of the older photographic workers, who have practised silver printing for more than a quarter of a century, and to whom we naturally look for information as to the permanency of prints got by different methods. It would appear that theoretical reasoning on the subject of the permanency of silver prints is little to be relied upon; not, probably, because the theories are wrong, but because we have not taken into account all the factors which govern the matter. When, many years ago, the alkaline toning bath was introduced, and the habit of toning and fixing in one solution was given up, we were told that perma-

nency would result. Has it? Most certainly not; but we imagine that there is a general impression among photographers that at any rate a nearer approach to permanency has resulted from the change. From the information given at the meeting which we refer to, it would appear more than doubtful whether even this much may be said with truth.

The lecturer had confined his remarks for the most part to the albumenizing and sensitizing, but the discussion drifted in the direction of toning. Mr. Ayres handed round several large-sized prints, which had, he said, been produced twenty years ago, and which had since been kept "anyhow." These were as perfect prints as we have ever seen. There was not a trace of either fading in tone, or of yellowing of the whites. The first question which was asked of the exhibitor was in what bath they had been toned, and no little surprise was evinced when Mr. Ayres replied that they had been treated by the sel d'or or mixed gold and hyposulphite of soda bath. The surprise was still greater when Mr. Ayres went on to say that the prints which had been toned by him in this bath had, without exception, shown greater permanency than those toned in the alkaline toning solutions, which is, at the present day, all but universally used. This statement was, however, fully borne out by Mr. York, than whom no one ought to be able to give better evidence on such subjects. Reference was made by a member to a certain series of stereoscopic slides which had been produced about twenty-five years ago, and which, he said, were now as bright and unfaded as when new, whilst others of more recent date, which had been kept along with them, were faded.

It happened that the author of this series was in the room, and, in reply to a question, he said that they had been toned by the sel d'or bath. There did not appear to be a single one among the elder workers who did not indorse the statement that the most permanent silver prints that had been produced were those which had been toned by the hyposulphite of soda and gold toning baths. It was not stated that all prints so toned were permanent; merely that amongst those so toned were to be found the most permanent. The pertinent question was asked: Why, if the sel d'or bath could give the most permanent prints, had it also given prints which had faded as rapidly as did the sulphur-toned prints, which were in vogue before gold was used at all? The answer was clear enough. The sel d'or bath is totally different in its action from the alkaline gold bath. The latter bath ceases to tone whenever the gold which is in it has all been deposited. The former does not, because by the time that the gold has been exhausted from it there are present all the constituents for a sulphur toning bath; that is to say, there is hyposulphite of soda with dissolved in it sulphite of silver got from the decomposition of the chloride of silver of the prints which were first toned in it. As a consequence, the bath continued to tone after the gold was exhausted, and photographers wishing to make a small saving continued to use it, imagining that they were toning their prints with gold, whilst in reality they were using the old sulphur toning bath.

The most experienced printers of the meeting were of opinion that if the sel d'or bath were properly used, a certain proportion of gold chloride being used for each sheet of paper toned, and the baths being afterwards poured away, a great increase in the permanency of prints would be the result.

We cannot enter here into the possible reasons for the greater permanency of prints toned and fixed in a mixed bath than those toned in separate baths, but may mention one likely cause which was pointed out by Mr. Henderson.

When toning is done first, and fixing afterwards, the toning is performed in the presence of the whole of the chloride of silver in the paper. When toning and fixing are done together, the toning is not commenced till at any rate the greater part of the chloride has been removed by the hyposulphite of soda.

It is an undoubted fact that the presence of salts of silver in the paper during toning have a very marked effect on the permanency of the print. It is well known that if but little of the free nitrate of silver be washed out of the paper before toning, the operations will take place with great rapidity. The prints are, however, much less permanent than than those which have been thoroughly washed before toning commences.

The importance of the subject discussed cannot be overestimated. We hope that those of our readers who have had long enough experience in the matter to form an opinion, will let us know what that opinion is.

Another subject which was treated of both by the lecturer and those members who joined in the discussion was, that of "ready-sensitized paper." The opinions given by those who had experimented in the matter was, that none of the published formulæ gave papers the same as those to be purchased commercially. It would appear that the means of making a sensitized paper which will keep well, tone easily without fuming, and give a good quality of print, is one that has, as yet, been kept a trade secret.

MR. H. J. NEWTON'S ACCELERATOR.

IT will be noticed in our reports of societies that the suggestion emanating from Mr. H. J. Newton (New York) to add a few drops of a solution of iodide of mercury to the washing soda developer, to act as an accelerator, is receiving some attention on this side of the Atlantic. The subject has been under discussion on two occasions recently before the London and Provincial Photographic Association, the gentlemen who made the subject one of experiment averring that the addition was beneficial, although they did not find the enormous gain claimed for it by the introducer.

Mr. Newton makes two solutions as follows:—

A.—Bichloride of mercury	...	30 grains
Water	...	4 ounces
B.—Iodide of potassium ...	...	90 grains
Water	...	1 ounce

When these are dissolved, B is slowly added to A. The result should be a clear solution, the excess of potassium iodide dissolving the red precipitate formed on the first addition.

The developer is composed of:—

Carbonate of soda (dry)	...	25 grains
Sulphite of soda... ...	...	4 ,,
Pyrogallol...	...	2 ,,
Water	...	1 ounce

Our own trial consisted in exposing three plates, five, fifteen, and twenty-five seconds respectively. The conditions as regards lens, diaphragm, and strength of light being the same in each case. The plate which received the largest exposure, viz., twenty-five seconds, was developed for six minutes in a developing solution compounded as above, and is beyond all doubt the best negative of the three. The plate which received fifteen seconds' exposure was developed four minutes in a similar solution to the first plate; the details being nearly all out when two drops of the iodide of mercury solution were added, and the development continued another four minutes. Finally the plate exposed five seconds was treated similarly to the first as regards length of time in the first developing solution; then three drops of the so-called accelerator were added; the development continued three minutes longer, then another three drops of accelerator, the development being prolonged another three minutes. Six drops more were added, making twelve in all, and time of developing increased to eighteen minutes in all. The result was a little disappointing. The negative was purposely

very much under-exposed, it is true; but we had some hope at the outset that we should be able to get a printable negative. Such, however, did not prove to be the case. Whatever we might be able to do with ammonia, or soda alone, in the way of forcing, we could not do with iodide of mercury added. There appears to be a certain amount of intensity gained by a slight addition of the mercuric solution. The same may also be said of iodide of potassium, tincture of iodine, and several other substances; and with certain batches of plates we think the addition recommended is likely to prove beneficial. In our hands iodide of mercury does not supply those sterling qualities attainable by a full exposure.

Modifying the conditions, by omitting the sulphite of soda, making the soda solution stronger, and also adding fifty per cent. more iodide of potassium to the mercury solution (five drops of this mixture being added to the developer before starting), we obtained a better result, the plates being exposed under similar conditions to those described above.

NOTES BEARING ON THE GELATINE EMULSION PROCESS.

BY DR. J. M. EDER.

Hemp Fibre for Filtering Emulsions.—To prevent air-bubbles in the filtration of emulsion, it is usual to employ cotton-wool as filtering medium. This, however, frequently gets pressed together, and then the filtering takes a long time. Much more quickly acts sheep's wool or unspun hemp. I now employ the latter exclusively, and can filter a pint of emulsion in a minute. A funnel having a little bulb at the top of the neck, as shown in the annexed sketch, is advantageous, I find.

To Introduce Nitrate of Uranium in Gelatine Emulsion is a process not attended with success so far as I have tried. All the kinds of gelatine I have been able to procure coagulate with this salt more or less. Two per cent. was sufficient to form a sinewy mass, and I found no advantage was to be gained by the addition.

Oxalate of Uranium and Potash, employed as a developer for gelatino-bromide plates, did not come up to the expectations raised in my mind by its powerful reducing qualities. The uranium salt* was dissolved in an aqueous solution of oxalate of potash. A dark brown solution is formed which has a strong reducing action upon gold, silver, and platinum salts. Used as a developer upon a gelatino-bromide film, it gives, however, but a very weak image. Not only was the sensitiveness very small, but the picture very thin. The gelatine became tanned like leather, and perhaps herein was the explanation of the above phenomenon.

Red Prussiate of Potash, which destroys every description of light fog in gelatine plates, renders most kinds of gelatine insoluble, a fact that was unknown to me some years ago, when I suggested this substance as an antidote to fog. A solution of hard gelatine, treated with red prussiate of potash, remains clear, but yields on cooling a caked mass, which, on warming, melts with difficulty, if it melts at all. Once dried, its insolubility is increased. The admixture of this salt may therefore be employed as a hardening material.

A mixture of Gelatine and Red Prussiate of Potash is Sensitive to Light.—As I have just said, a dried mixture of the above is almost insoluble in warm water, and swells up but little, if at all, in cold water. By exposure to direct sunlight, yellow prussiate of potash is formed, and the solarized parts become blue. These parts then swell up more easily, and are more soluble in water (exactly the reverse of what takes place when a mixture of gelatine and bichromate is exposed to light). Here, therefore, is the principle of a new photographic process.

Density of an Aqueous Solution of Oxalate of Potash.—It is easy to test the amount of salt in a solution of crystallized oxalate of potash by means of the hydrometer. An ordinary hydrometer of Baumé, which is to be found in every laboratory, will answer the purpose, if only recourse is had to the following table, which I have prepared for the purpose:—

The Solution contains					Density at 15° C.		Degrees Baumé.
1 part oxalate of potash in							
		3	parts	water	1·159	...	20½° B.
,,	,,	4	,,	,,	1·126	...	16° B.
,,	,,	5	,,	,,	1·103	...	13½° B.
,,	,,	7	,,	,,	1·076	...	10° B.
,,	,,	10	,,	,,	1·055	...	7½° B.

The Pre-exposure of Gelatino-bromide Plates.—It is well known that the pre-exposure of all kinds of plates, whether wet or dry, has a favourable influence upon their sensitiveness. The following experiment shows how the sensitiveness may be increased two to threefold. An emulsion prepared with carbonate of silver and ammonia, with half-an-hour's heating to 40° C., was found to give No. 15 on the Warnerke scale. A plate, however, stood close to a red lamp (candle) for two minutes, previous to exposure, gave No. 19 on the Warnerke sensitometer. By standing a plate close to the red lamp for six minutes, Nos. 19 and 20 were legible. Pushing the experiment further, the plate fogged.

The Action of Warmth upon the Sensitiveness of Gelatine Plates.—A well-dried and vigorously working plate has its behaviour at once changed if it is heated at the back from 60 to 120° C. My friend Mr. Plener, a well-known correspondent of the NEWS, communicated to me this fact. The plates become much thinner by the action of warmth, and certain parts of a film may be so attacked that they have no density at all. Experiments conducted on my own part bore out this discovery of Mr. Plener.

* This I prepared by exposing to light for months, mixed solutions of oxalic acid and nitrate of uranium.

By-the-Bye.

WHO IS A PHOTOGRAPHER?

A GRUMBLE, long if not loud, has recently been heard on the subject of authorship in a photograph, but it was reserved to Mr. Pancoast, the secretary of the Philadelphia Photographic Society, to put this grumble into words. We think a good deal of credit is due to Mr. Pancoast for formulating the grievance—or, rather, supposed grievance—for it is only in this way that the matter gets fairly discussed. The introduction of modern dry plates, said Mr. Pancoast, is responsible for the creation of a new class of amateur photographers. "These men buy their plates, expose them, and take them to a photographer to be developed; then they come to the Society and say, 'I made this picture.' The question is, how much did they make? All they did was the uncapping of the lens, and once in a way they got a picture, but very often they did not."

These are Mr. Pancoast's words as printed in the Journal of the Society, and we say we owe a debt of gratitude to that gentleman for speaking out on the subject. For it is now possible to discuss the state of things put before us, and estimate it at its real value. We have heard the same complaint, put forward in almost the same words, many a time during the past few years, and the question naturally arises: Is there anything in it? To be frank in our reply, we think not. We believe that

there is no instance on record of any man obtaining credit as a skilled photographer, whether in the shape of a medal or of fame, for prints secured under the circumstances mentioned by Mr. Pancoast. No doubt instances could be produced, among professional photographers, in which principals have obtained *kudos* for work done by assistants, but this is not the case in point. The complaint is, that one who knows nothing of photography brings forward work with the words, "I made this picture," when he has done no more than expose the plate in the camera. Our view of the matter is this: that in nine cases out of ten, the picture exhibited by a novice of this kind will show no more merit than was to be anticipated from its mode of production; and when your brand new amateur says, "I made this picture," you will fully believe what he says.

But supposing an ignoramus shows you even a dozen prints from plates which he has simply exposed, what then? The pictures will call for no comment. They will never raise the ire of a Russell Manners Gordon, a Seymour Conway, or a Whaite, to name three well-known artist-photographers who make their own plates and make their pictures as well. Were our novice at photography even a fine landscape painter, possessing, therefore, the keenest eye to composition, he would be equally impotent to bring forth pictures comparable in any way with the photographs that take awards at our exhibitions. The novice, we grant, obtains material assistance in getting his plate developed for him, although, here, he is not likely to secure the aid of men in the foremost rank—men who have won medals, and know how hard they are to win. But he has the exposure to make himself, and a man profoundly ignorant of photography and its capacity could only secure a good picture by the most fortunate fluke in the world. To obtain then a series would be virtually an impossibility, we hold; at any rate, nobody, we venture to say, has ever heard of a man taking out a camera half-a-dozen times only, and exhibiting as the result a frame of those soft, delicately-pencilled views, with transparent shadows and hazy atmospheric effects, such as good photographers find no difficulty in producing year after year, and showing in our exhibitions.

To choose the proper direction, to judge of the lighting, to adapt photography to chiaroscuro, to maintain proper contrast photographically as well as artistically; in short, to bend your tools to furnish a successful picture, to say nothing of the dozen technical details connected with focussing and exposing—to do all this is necessary to the getting of a successful photographic picture. The ignoramus may, by a fortuitous concourse of circumstance, hit upon success in all these matters, and then, if the plate is not spoilt in development, he may bring forth a photograph to rival one of Russell Manners Gordon. But we must say we have never seen any such marvel, nor heard of one. What we have seen many a time and oft, are little brown prints representing scenes of travels, which fulfil their object well enough as mementoes for the traveller, and which, to the traveller himself, are of value; but these—the result of a few hours' practice with the camera—no more enter into serious competition as pictures with the productions of a Robinson, a Bedford, a Payne Jennings, or, to instance three clever amateurs, a Brightman, a Gale, or a Manfield—than would the sketches of a boarding-school Miss vie with the water-colour drawings of Leitch, Varley, or David Cox. There is surely no harm in gentlemen making use of photography even to the most limited extent, if it so pleaseth them, and until they usurp the honours of an exhibition, we may well afford to smile when they say, "I made this picture."

No doubt, of two gentlemen who exhibit pictures equally fine, the one who has made his own plates and his own emulsion deserves, as a photographer, more honour. Unfortunately, or perhaps fortunately, it is seldom that the series of exhibits are exactly alike, and jurors are not frequently called upon to adjust the beam so nicely. But we must mind not to be carried too far with this argument. If a man produces his own plates as well as his own pictures, it is not likely that his lens and his camera are home-made; nor is the paper on which the pictures are printed prepared by him, if, indeed, it has been sensitized with his own hands. In the good old days, the photographer rarely made his own collodion and iodizing mixture, albeit, he generally made his own bath; so that he has a very good precedent for considering that he is not called upon at the present time to produce the sensitive film upon which the picture is taken.

Again, it must be remembered that he who can prepare his own emulsion, and prepare it well, enjoys this undoubted advantage: that he knows more about the plates he is using, and hence has the more chances of final success. And as it is by final success that he and his brother will be judged, this making of his own emulsion handicaps his rival.

Development in many cases is a work of infinite skill, especially in the case of the out-door photographer, and this is why we say that if a man gives over his plates to another to develop, the results, if good, are never likely to be of first quality. Any photographer will convert the exposed plates into clear bright negatives for him, but let the former be ever so skilful, you cannot expect the same result as a Russell Manners Gordon naturally gets by slowly and gently developing a subject he is familiar with. We say slowly, because it is only in this way that the beauty of the picture is thoroughly under control. Mr. Gordon once said that to develop two plates in a day was quite enough for any amateur, and although he remarked this in respect to the old gum-gallic process, it holds good, with slight modification, at the present day. Now Ignoramus is scarcely likely to get a Gordon to develop his plates, and therefore we repeat that his photographs, inadequately exposed, are likely to be inadequately developed as well.

We are speaking here of out-door photography only, because the new class of amateur that some of us are afraid of does not practise in a well-ordered establishment. The development of plates taken in the usual conduct of a studio is another matter altogether, and may be undertaken almost mechanically. The sensitiveness of the plates used is so well-known, the lighting so much under control, that in several first-class studios the development is now done by time and in a rocking trough, several plates being treated simultaneously. Here the whole of the artistic photographic work is done at the time of exposing. The late M. Adam-Salomon, certainly our premier portraitist, did not, as a rule, develop his plates, but contented himself with the lighting and posing of the model; during the last years of his life, indeed, he scarcely entered his own dark-room, but engaged the most skilful photographer he could find to aid him in the photographic work. Mr. Valentine Blanchard—to give another authority—on the other hand, never permits the development of a portrait to be undertaken by anyone but himself, and it may be remembered that when he worked the collodion process he frequently made use of daylight, half way through the development, to intensify the picture.

The development of out-door plates, even when the emulsion has much latitude of exposure, is then very different to treating films lighted uniformly in the studio. We come, therefore, back to the conclusion that the new class of amateur is quite welcome to all the honour and glory he is likely to get from his method of co-operative photography, and that though he may be well content with such prints as he obtains, these are never likely to deprive the careful and painstaking photographer of his rightful due.

The "By-the-Bye" next week will be "Something Practical About Lenses."

CAMERA LUCIDA—PALETTA OBSCURA. A STUDY IN LIGHT AND SHADOW.

BY HUME NISBET.*

MY subject—the union of painting and photography—is not so short as you or I might wish it to be, yet I have tried to make it as terse, as a subject so crammed with incident, and so exhaustless in manner, could he made. Yet, if you will try to endure it to the end, I trust you will not be disappointed.

Photographers, as far as I have seen of them, are a jealous-minded race. They don't think enough of their art, or of themselves. They are too apt to think that the painters despise them, while in reality the painters of to-day hang on to them as a drunken husband is apt to hang on to his good-templar wife during this festive New Year season; or, to be more poetic in simile, as a half-drowned sailor will clutch on, teeth and nails, to the hard rock which may have broken up his rotten old boat, but now keeps him alive in the middle of the surf. The painters of to-day have become realists, and photography is realism, or nothing.

A photographer, to be able to produce a good picture, must be a true painter in the highest sense of the word; so a painter ought to know the right qualities about a good photograph, whether he knows the mixing of the chemicals or length of exposure, or process of focussing, &c., or not, although to he able to compete, the tricks of the trade have to be learned. Witness Napoleon, Sarouy, Mora,† and such men, with their fancy dodges and splendid effects, and Seavey, with his unapproachable backgrounds.

Thus my title is almost superfluous, for painting and photography, requiring the same direction of talent, are already united; only it may be of a little service to hear a painter avow the marriage publicly, which is so constantly being consummated on the quiet.

It is in your work, as in ours, the doom to be annoyed constantly with talented triflers who dip a finger into all the sciences, and are for ever ready to dispute the poiut with the originators—buyers of brains—who imagiuethat their cash gives them full liberty to find all sorts of faults, or suggest improvements upon the worker's designs; who will not huy unless their idiotic improvements are executed to the last letter, and who afterwards lay the whole blame of the spoiling of the pie upon the haker, when the guests condemn.

Having a direct object in view, I need not trouble you about chemicals, or lenses, Aurora lights, or secrets that you all now know much better than I, but will come direct to what is of vital interest to us both in our wedded state—viz., the seeking how we may put as much of the soul of nature, with her innate force of feeling and motion, into our pictures as possible; the men, modern and ancient, who may best aid us hy the examples and teachings they have left as a legacy to us; a quiet consideration of what they really have done for us; a right straight look at the men themselves, unbiassed by veneration or prejudice, with a consideration as to how much we have taken advantage of the legacies left to us.

The first aim of our investigation is, therefore, the *Exact Imitation of Nature—i.e.*, the outward form and appearances of nature, the body, in fact, of that mystic Deity whom all men worship, no matter what is the dogma, whether they have a creed or whether they be creedless.

Secondly,—The *Feeling, Sentiment, or Sensations of Nature*—how her appearance touches us, as we look upon her in the wealth and loveliness of her colouring, also how we may keep that sentiment alive in our light and shade.

Here the painter, with his colours, gets a better hand and a long start ahead of the photographer, engraver, and etcher; and it is here that if those workers in light and shade can keep the sentiment as well as the painter in colours, they gain a double and richer triumph—the triumph of a racer who has been heavily and unfairly handicapped at the beginning of the race.

Thirdly,—*The Motions, Actions, Passages, Expressions, and Impressions of Nature.* There, both in photographer and painter the man himself is brought out, whether he is a trained mechanic or a horn genius.

Lastly,—*The Perfect Image*, the whole innate force, which ist he spirit and soul of that matchless creation towards which we must all constantly turn (as the sun-flower turns or the daisy opens to the glance of day) for the light and life of our artistic beings.

Let us drop the weak word artist out of consideration altogether. Personally I abhor it, as denoting nigger minstrel, sword-swallower, or that undefinable member of society who plays with single foils and sable hairs inside a studio, enriched with Turkey ruggery, old armour, and marble busts. Let us, who are workers, be plain painters and photographers, never heeding the comforts of our surroundings, having only to do with objects as accessories to our work, thinking only upon the *utility* of every nick-nack we may have, aiming only at the result without considering the trouble or the inconvenience to the animal who is bringing it all about, every conception or experiment being an undiscovered country which we mean to find all out and make our own—Stanleys or Thompsons with our Africas; Pizzaros conquering and annexing our Mexicos; plain, hard-working, earnest painters and photographers; brothers in one grand service—Art.

I think, at the present day, painters recognize this fraternal staud even more than photographers give them credit for doing; they know how much they are indebted to the camera for making matters lucid which were before obscure. Witness the galloping horses done by instantaneous process, the shape of waves in full action, the rushing of waterfalls, and the contortions of muscles in moments of great excitement. How many of the old masters knew what a horse at full speed was like? and what eye-openers to battle-painters those photographs have been. None of the sea-painters were able to draw a wave in all its subtiltics and froth accessories as painters now-a-days may do if they study the imprint of a flying second; we may also have clouds in their strata, as they actually are, with shadows perfect, in those artistic studies coming, like the institution of Christmas cards, more and more into vogue every year that we live. And painters do use them constantly, whether they admit the fact or, induced hy a false pride, pretend that they do not. I see in every exhibition glaring evidences of hay-carts and field horses, yachts and ships of all degrees, blankly copied, with hardly any disguise, from the photographic studies suspended in the shop windows. Clear photographic studies, faithfully drawn out, and in the painting knocked about a little, sometimes not so true as the original to Nature, blurred and mystified into that obscurity which does for feeling with the crowd, the most original bit of painting being the man's signature who sells it, that strictly being his own, and not the copyright of either the photographer or the horse.

And why not? Clouds will not wait on our pencils and palettes being set; horses will not stand until we draw out a faithful enough study of their forms, nor ships pause until we get in all the rigging. The winds are against it, and the waves. The hours flying along and tearing down the sun-shadows before we have fixed one line of them on our paper or canvas join in the protest, jeering at our deliberation, and mocking us as slow coaches in these steam-engine days, we trying to crawl on six miles an hour, and dreaming that we can enter into competition with the mile-a-minute express.

The pride which keeps the artist silent, or makes him deny the charge of photo-borrowing, is an utterly false pride, and the sooner it is knocked out of sight the better for all parties. Why should we not correct our sketches—done for the sake of the colour and feeling, and not for the form—from faithful photographs? It does not hinder us from being original in the after-treatment, although it may save us much time in the elaboration of sketch-details. Why not save our precious time for something so much more worthy of it—the picture?*

Hitherto I have wanted so much to be original that out of conscientious scruples I would not use the photographic studies which some of my friends have sent me. I looked upon them longingly, and put them out of sight reluctantly, and so went down to sea-boards and meadows, catching rheumatics and toothache, and wasting hours upon hours, and many valuable sheets of Whatmau's hand-made paper, trying to draw out all the rigging of ships, and the shapes of cows, losing the effect often in my endeavours to get the manipulation, and in reality not getting a hundredth part of what I might have got with half-an-hour's rapid dashing on of colour effects, and a moment's focussing.

At present I know little or nothing about the art of photo-

* Read before the Edinburgh Photographic Society.

† Three of the photographs shown at the meeting were by Sarony and Mora, kindly lent by J. L. Cox, Esq., representative of the firm of Mason and Co.

* Only not to the encouragement of lazy habits, at times (for the sake of practice), a painter ought to draw the most minute point detail with the pencil, as a singer practises his scales, otherwise for the object the photo. is most to be relied upon for truth in all, *except perspective.*

graphy, but I intend to make it my duty to learn a little more, —enough to be able to sight a picture correctly, take and develop a dry plate, and afterwards fix a print; for I can see plainly that time is coming on with rapid strides to the point when, along with his present utensils of colour-boxes and sketching block, the painter will require to carry his camera and stand, box of dry plates, and head covering. And how proper is it that it should be so, a little experience will prove to every one. An old castle or abbey, or the view of a town, or even the markings upon the trees, it would take us days to outline; the buildings of the town, the fret-work about the abbey and castle, or knots and gnarling of the woodland—and even then it would be incomplete. To illustrate my meaning, look at even the most careful outline pencil drawings of Turner, one of the most delicate of outline draughtsmen, *when he liked*, or the scrupulous and untiring delicacy of his admirer, Professor John Ruskin, with his pencil, and compare those efforts with the lines about even the most common-place photograph of a building or tree-trunk, and I need say no more on that point. The painter has lost the half, and distorted the rest; and although the drawing may appear more attractive at first sight, the photograph will be the best, for it embodies the first grand principle of a painter's training—faithful imitation of the object which he desires to represent. Photographers are apt to labour under the mistaken notion that we do not recognise this plain fact of artistic necessity; but we do, and if we do not have the manliness to own it, that is our cowardice and not our blindness. Be content, therefore, when you go into exhibitions and see the misty result of your photographic-studies in the realism of to-day hanging all round: that is recognition enough of the obligations palette owes to camera.

To consider the first of our united art aims—viz., "*The Exact Imitation of Nature*,"—as she appears to us, and as she appears to others. The eye is the organ to which we all appeal, and I do not know a more fickle umpire—except, perhaps, the ear. I had a friend once in Auckland, New Zealand, who had weak eyes, and used blue spectacles for the glaring. He never was satisfied with my colouring, the yellows always had such a green appearance. "Why won't you stick to pure chrome?" he used to ask, seriously transfixing me with two blank window panes of deep indigo. Many people are colour-blind, yet not entirely so, and more is the pity; but just on one point, *like the sun-stroke of Sir Roger Tichborne*; and the worst is, they are not aware of that particular point, and feel quite put out if it is explained to them. They will think the man an ass who tries to prove them wrong, for if they are strong upon any point, it is upon that particular point. I have proved it dozens of times in cases of partial sun-stroke and colour-blindness. I mean, just a slight wipe out of the mental slate, a blurring, or, as it were, a Dutch effect in the case of sun-stroke; or a delicacy of perception wanting in the colour-blindness, a gauze veil dropped over, not nearly so apparent as the blue glasses, or the lack of distinction between red and green, for daltonism, like this, ought to be palpable, both to the sufferer and his suffering friends. There is also a distortion of vision apart from nearness or longness of sight, which is a very troublesome agent to fight against for the producer of pictures, a little nerve gone agee through partial paralysis, or an accident before birth, and everything is different to him than to any one else, or it may be that it is spasmodic and occasional in its effects, and then woe to the picture that comes under his lash (if a critic) at the moment the twisted fit is on him.

Ten artists sit down to one landscape and make ten different pictures, and the camera drops in and makes the eleventh, like none of the ten, but wonderfully like the original, as those ten different pairs of eyes will testify, in spite of their varied distortions. Ten different critics look at a picture and find out different faults, each praising as virtues the faults of the nine others. Ten women will look upon one man, and ten chances to one, they will all find different uglinesses about him, with the exception of the tenth, *whom he may have chosen*, and yet they will all unite in agreeing that she wasn't worthy of him; which clearly proves, I think, that this form-distortion of vision is only partial.

Realism is the passion of the day, both in writers and painters; and this passion photography is only too well qualified to gratify. To note down a scene or describe an emotion by the aid of its most minute outer symbolism, as faithfully and as free from complexity as possible, seems to be the greatest virtue and the highest aim of the modern school. The names which I would select as samples of this style of work will be those names which, by engravings and etchings, are best known to us, and so likely to be of most use in our search after excellent examples. Amongst the old masters I would quote Albert Durer, Rembrandt, and David Teniers. I take those three great names as samples, because their manners are distinctly separate, because their systems and tricks for reaching effect are easily penetrated.

(To be continued.)

Notes.

An International Photographic Exhibition, to be held this year in Berlin, is spoken of. Unfortunately, the German Societies do not seem to be all of one mind, and at present there is little prospect of making the gathering representative of Germany, let alone civilised nations generally. The German Photographic Society, which has its head-quarters at Weimar, will hold their annual meeting in Berlin, and this circumstance apparently gave the idea of an exhibition. But the biggest of the Berlin societies has not, so far, ratified the scheme, and without this aid its prosperity is very doubtful.

The last weekly return of sunshine made by the Astronomer-Royal shows an improvement, for he tells us that while the sun was above the horizon fifty-six hours, it shone no less than three hours at Greenwich. The previous week the number of hours' sunshine was officially returned as 0.

The photographic album was scarcely likely to escape long the attention of moralists. Last Sunday, at one of the suburban churches, the preacher put very forcibly before his congregation the uncertainty of life. "Look at your family album of ten years ago, and see how many faces appear in its pages that are now mere memories of the past." The illustration is, indeed, apt, for it comes home to us all.

We have before urged upon our readers never to disturb an album of portraits that embraces friends and relatives. A book of notables or of beauties you may do with as you please, but spare your household gods. If a friend gives you a better portrait, take it, but let the old one be; and when your album is filled, put it away, and allow no one to meddle with its pictures. Gradually, as years go on, its value will increase apace, and in time to come you will possess a treasure which, to your inmost self, is beyond price. That book to you will contain more old stories, tender recollections, odd fancies, bygone memories, and touching reminiscences—half solemn, half sad—than are bound up in the weightiest volume of history or romance.

Not only to the old, but to the young, is the family album a cherished treasure, as a short story we can tell amply proves. A little girl of five, of parents who had emigrated to Australia, learnt all she knew of her cousins in far-away England through this volume, and so often had she studied the bright faces that a longing to be with them was for ever in her soft little heart. A friend once told her the

story of the Piper of Hamelin, and how, having been ungratefully treated by the burgomaster, the piper enticed away all the little children of the village, who followed him into a chasm in the mountains, and were never seen again. "Did they die?" said the child. "Oh no; there was music and lights and dancing, and they lived on merrily," was the reply. "Were there any cousins there?" asked the little exile, wistfully.

The ordinary gelatine negative may be stripped with a little care, if the glass to which the film is attached is well polished and free from any of those tiny points of roughness that common glass frequently displays; to strip from patent plate is, indeed, easiest. With a pen-knife you cut through the film one-eighth of an inch from the edge, and carefully raise it; warmth will sometimes assist the operation. As the film is scarcely thicker than gold-beater's skin, you must be careful not to breathe upon it, for moisture thus unevenly applied brings about partial cockling, that is afterwards difficult to remedy.

Mr. Plener's method of stripping is, however, applicable to any plate whatever. The negative is immersed in extremely dilute hydrofluoric acid—a few drops to each ounce of water—and as the acid penetrates the film and etches the glass, instant separation takes place, and the film floats off. It can be dried flat by squeegeeing it on a slightly waxed glass plate, from which it separates easily when dry. If a more rigid film is required, a sheet of plain gelatine should be soaked and squeegeed down over the film.

The regulation made by the Belgium Photographic Association, that its members would be admitted to the Exhibition on presenting a card with a portrait upon it, seems to have exercised a singularly rejuvenescent influence. Everybody became, on the spot, ten years younger—at least, in their portraits. Well-known members, whose beards had been streaked with silver for years past, presented pictures of black-bearded Adonises, and those whom Father Time had robbed of their ambrosial locks appeared once more with well-dressed coiffure. Fortunately, the secretary was present with the check-taker at the inauguration, or there might have been some difficulty in declaring the Exhibition open.

New aspects of the copyright question are continually cropping up. The latest is comprised in a somewhat novel point recently raised before the Paris Tribunal of Correctional Police. Some miniature portraits had been photographed with the consent of the artist, and afterwards coloured. The art of colouring photographs has in Paris been brought to great perfection, and in this case the copies were so faithfully rendered that they could not be distinguished from the original miniature. A suit for piracy was brought by the owner of the latter, and the Tribunal decided that copyright in a painting extended to every form of reproduction, and that the offering of photographs—though they may be taken with the artist's consent—coloured for sale was an infringement of copyright in the picture, and is prohibited.

Many enterprising photographers have found Board schools do them good service. Their plan is to get the permission of the master to photograph the various classes, and as in all probability each child's mother will want a copy, the photographer can afford to sell the latter at a low price, and yet get a good profit. The constant changes, too, which are going on in schools render a fresh series every year possible, and so a regular source of income may be depended upon.

But there is a danger lest the photographer should kill the goose which lays the golden eggs. Talking with the master of a large Board school the other day on the subject, he said that he had refused permission to have the school photographed on the ground of the trouble it cost him personally. "Just imagine," he remarked; "I have fourteen classes, and it would be necessary for me to stand for my portrait fourteen times, because the boys would have nothing to do with a picture which did not contain a portrait of the head master as well as the pupil teacher. Then there may be one or two failures, so that sixteen times, at the least, I may reckon I have to stand for my portrait. But this is not all. The photographs are sent to the school, they arrive in batches of two's and three's, I have to distribute them and hear the complaints of those who are kept waiting for their proofs; I have to collect the specimens; and virtually I am turned into a photographer's assistant."

We were compelled to own that there was justice in our friend's complaints, and ground for his refusal; but we may also remark that he let fall a hint which photographers who go in for this class of business might do well to note. "The photographer," he went on to say, "pressed me very much to have the school done, and wanted to know how he could make it up to me. Of course such a thing as a pecuniary equivalent was out of the question, and I flatly refused. But I don't know if he had offered to subscribe a guinea to our Teachers' Association that I should not have consented."

The comet Pons-Brooks has had the honour of being photographed. This has been accomplished at the Observatory of the Liverpool Astronomical Society, West Kirkby. The exposure was fifty-three minutes, and the appearance on the plate is that of a circular haze without any tail. A heavy dew was falling at the time of exposure.

Another view as to the best light for the dark room. Meeting Mr. Samuel Fry the other day, he greeted us thus:—"All through our factory we use one thickness of cherry fabric, and a sheet of white tissue paper, as a protection against artificial light. The tissue paper has a truly remarkable effect in diffusing the light, while the "cherry" tint is more agreeable to my eyes than either

the glaring colour of ruby glass, or the heavy gloom of orange. We use no daylight in our dark rooms, as its variations would quite upset our work."

Patent Intelligence.

Applications for Provisional Protection.

912. Robert Galland-Mason, of Hambleton House, Promenade, Douglas, Isle of Man, Schoolmaster, for an invention for "An instrument to be called the microphotoscope."—Dated 8th January, 1884.

934. William Henry Duncan, of Coalbrookdale, in the county of Shropshire, Engineer, for an invention for "Improvements in apparatus for changing dissolving views."—Dated 8th January, 1884.

1042. Samuel Dunseith McKellen, of 18, Brown Street, in the city of Manchester, Watch Manufacturer and Jeweller, for an invention for "A new photographic exposing apparatus."—Dated 9th January, 1884.

1113. Thomas Storey Davis, of Halifax, in the county of York, Photographer, for an invention for "An improved construction of apparatus for photographing without the aid of daylight."—Dated 10th January, 1884.

1206. Leon Warnerke, of Champion Hill, in the county of Surrey, Gentleman, for an invention for "Improvements in shutters for photographic purposes."—Dated 11th January, 1884.

1251. George Rydill, of 52, Chancery Lane, in the county of Middlesex, for an invention for "Improvements in treating and producing coloured photographic transparencies for decoration and production of various designs on sheet or plate glass, glass-ware, talc, gelatine, bladder, parchment, or paper, so as to represent stained, cut, embossed, or enamelled glass in one or any number of colours or designs."—Dated 11th January, 1884.

Patent Sealed.

3476. Richard Brown, Robert William Barnes, and Joseph Bell, all of Liverpool, in the county of Lancaster, for an invention of "Improvements in means for and methods of producing designs upon paper or other fibrous or soft material, or upon metallic surfaces."—Dated 14th July, 1883.

Specification Published during the Week.

2495. John Imray, of 28, Southampton Buildings, Chancery Lane, in the county of Middlesex, "Improvements in the manufacture and treatment of photographic paper."—communicated to him from C. Cros and A. Vergeraud, both of Paris in the Republic of France. (*This Invention received Provisional Protection only.*)

This invention relates to the manufacture and treatment of photographic paper for the purpose of reproducing by the action of light the dark lines of designs drawn on transparent surfaces such as tracing paper, glass, and the like, or the images of flat objects that can be applied to the prepared paper. The paper can be prepared either during its manufacture by mingling with the pulp the sensitive materials, or these can be applied to the paper at some stage of its manufacture, when it can be moistened, or after its manufacture, whether the paper be sized or not. Thus, there may be added to the pulp which is to be converted into paper, a sensitizing solution of about eleven parts bichromate of potassa and 120 parts of dry glucose in 1,000 parts water, the quantity of the solution being such that the sensitizing ingredients constitute an addition of about sixteen per cent. to the weight of the dry paper. For sized paper the proportion of sensitizing material may be considerably less. Or, again, manufactured paper may be gelatinized in the usual way, impregnating it with a solution of about ten parts bichromate of potassa, 100 parts dry glucose, and twenty-five parts gelatine in 1000 parts water. Paper thus prepared is particularly applicable for obtaining designs in organic colouring matters. For developing, a solution of about ten parts nitrate of silver, twenty parts acetic acid, and fifty parts alcohol in 1,000 parts water gives a ruddy colour, which after washing and drying in the light becomes dark brown. Hydrosulphuric acid gas, reducing salts of copper or iron such as oxalates or ammoniaco-sulphites, carbonates of soda, and potassa may be then applied. By the action of the latter substances, carbonate of silver is produced which becomes blackened by exposure to light. Another developing solution consists of about twenty parts acetate of lead, twenty parts acetic acid, and fifty parts alcohol in 1,000 parts water. This gives a yellow, which is blackened by hydrosulphuric acid gas. Development in dark violet colour may be effected by applying a mixture of about twenty parts extract of logwood, fifty parts alcohol, and five parts carbonate of potassa, with 1,000 parts water, and then washing with water acidulated with oxalic acid to remove the colour from the ground. In all these operations, alcoholic liquids are preferable to pure water, as they dissolve less the bichromate. For the glucose employed in the sensitizing mixture, dextrine, sugar, or gelatine may be substituted.

CHAPTERS ON LANDSCAPE AND OUTDOOR-PHOTOGRAPHY.

BY H. P. ROBINSON.

No. 3.—Models.

It is only of late years that photographers have given anything like adequate attention to the figures they introduce in their landscapes. Anything that happens to be at hand, from a Cockney tourist to the porter who carried the camera, was once thought quite good enough for every occasion. Now, I am glad to see, something better is thought necessary, and if this is not obtained, the photograph is a very ordinary photograph indeed; and is usually, if admitted at all, passed over in an exhibition as a commonplace production. The sins against fitness become fewer every year, while anything really vulgar in taste is extremely rare.

There are those who go for absolute purity of production, unmitigated nature, who will admit nothing in a picture but what is indigenous to that picture, so to speak; but Art, according to Lord Bacon, is man added to nature, and unmitigated nature is certainly not art. I do not fear to say that nature alone, as a picture, has far less interest than the same nature represented by a great artist. "What are you painting?" said I to one of my painter friends when we were out on a certain painting and photographing excursion; "your sketch does not seem, if I may be excused the criticism, to be exactly a coloured photograph of the scene you have before you." "I am not painting a local view," was the reply, "I am painting what nature suggests to me." Now, as regards models, I seldom find the "real thing" to quite answer my purpose. The aboriginal is seldom sufficiently intelligent to be of use, especially if you have "intention" in your work

I remember a case in Wales very much to the purpose. Some artists who were of our party came home from a walk one day, enthusiastic about the beauty of a girl they had seen in a field two miles away, planting potatoes. I must go next day and photograph her. I went, and found they had not exaggerated; she really was a beauty, and her clothes also were lovely, both in colour and in delapidation. Knowing how shy the Welsh peasant is, I got the gamekeeper who carried my camera to speak to her first, and I approached the subject warily by beginning an agricultural talk with her mother. After a time I got the girl to stand for a picture, but it was a dead failure—all the "go" was gone out of her, and she looked as frightened as a hunted hare. After another trial, she objected to be tortured any more, and ran away. I persuaded her mother to bring her to the house next day. She came, and I got the housekeeper to talk to her, and left her for an hour to get used to the place and people. I then tried a picture. I posed her by the side of a pool with picturesque surroundings. Naturally she had a most winning smile, but I could not succeed in calling up anything better than a scowl. I got a fine picture in every respect, except in the one essential—the expression. The picture has since been called, "The Welsh Ophelia contemplating suicide."

But if fine nature, in the way of natural models, is not

to be obtained, art supplies the remedy, as I am now going to show.

I am quite conscious that I am laying myself open to the charge of masquerading, but art is a state of compromises and sacrifices, and I cannot but think that what is lost in absolute unrelenting naturalness when substituting trained models for the newly-caught raw nature, is compensated for in many ways. Graceful figures, if not over done, give an ideal tinge to the picture that lifts it above the cleverest transcript of mere prosaic fact.

My models may be called to some extent artificial, but they are so near the real thing as to be taken for it by the real natives, just as the trout does not seem to know the difference between the natural and artificial fly. One day two of my models were walking across the park, and a gamekeeper, seeing them for the first time, made after them, shouting in the high tone that sounds like quarrelling to the stranger when he first hears it in Wales. As they would not stop he did not hesitate to give way to all he knew in both languages, and did not cease to vituperate till, getting near them, he found to his dismay they were "the daughters of the house."

This, I think, shows that our imitation is sufficiently like the original for artistic purposes.

My models are trained to strict obedience, and to make no suggestions. If the photographer has really got an idea in his head, he had better carry out that idea. Any interference, even from superior intelligence, is sure to go wrong. Some people are wonderfully patient under the application of information, but I confess that I am so peculiarly constituted that the most admirable advice, when I am in the middle of posing a group, quite upsets the ideas I had, and I don't find it possible to adopt those offered. Therefore, from my own experience, I would recommend that if a friend feels the twitchings of sufficient skill to offer advice, you had better allow your candour to exceed your courtesy, and order him off at once. Two heads knocking together produce anything but harmony.

In speaking of my models in what I have written above, I allude to those that have appeared in many of my pictures the last few years. They are not always the same persons; in fact, I get as much change in that respect as possible, to avoid monotony. It is almost as difficult to get variety in dresses as in persons. I always endeavour to secure a picturesque dress when I see it. It is not always easy to explain what you really mean when you meet a girl in a

lonely country lane, and you offer to buy her clothes, but a little perseverance and a good offer usually succeed. A country girl's dress is not often worth more than eighteen pence, and if you turn the pence into shillings, and look business-like all the time, you may make pretty sure of walking off with the property, or at all events getting it sent to you next day.

Some models require considerable education, others take to it at once. One young lady, who had no thought of sitting, and I no thought of asking her to do so, as she was then almost a stranger to me, made one of the best models I ever photographed. We had no intention of photographing, but the camera was in the house, and half-a-dozen plates, and we had nothing better to do. The first picture she posed for is represented in the sketch. We had no costumes with us; but a sun-bonnet, bought in Regent Street, and intended to be worn while playing tennis, was as picturesque as one made of calico in the country. A white apron borrowed from a servant, and a handkerchief tied round the neck, transformed the dainty young lady into a comely country maiden. She was posed against a tree by the pond, and told to look a thousand miles away, and think of the future, and the result has been considered a success. The same model, half-an-hour afterwards, with very little change of dress, made a very good representation of a Puritan maiden standing by a window in an old oak-panelled room; and the remaining four plates were used up to like advantage.

Young children make good models; but you must capture them wild. To ask their mothers if you may have them is fatal. They insist on dressing them in their Sunday-school clothes, to "have their pictures took." Now a dirty country child is often a delightful lump of picturesque humanity; but when it is "washed, and dressed all in its best," it is about the most priggish bit of nature I know. It loses all its freedom, and becomes stiff and awkward.

Old people are often very useful in landscapes. With them, as with children, you may take the real native. It is between the years ten and thirty that the genuine peasant is so difficult to manage.

Sometimes a model will suggest a picture. Everybody knows the story of Rejlander and the model for his wonderful "Head of John the Baptist in a Charger." Rejlander saw this head on the shoulders of a gentleman in the town in which he then resided. The curious thing is, that he did not so much see the modern gentleman as always the picture which the head suggested. It was some months before the artist ventured to ask the model to lend his head for his purpose, and years before he obtained his consent. The result, from an art point of view, was splendid, and, considered photographically, a mystery.

One of the best models I ever employed was an old man of 74. He was a crossing-sweeper. I should never have accomplished one of my best works if I had not seen him sitting at a table in my studio, waiting till I could talk to him. I not only saw the old man there, but, mentally, the old lady, and the interior of the cottage, although, as it happened, he was sitting before an Italian landscape background. The old man, by his attitude and expression, gave the germ of the idea; the old lady had to be found, and the cottage built, but they appeared to me then quite visibly and solidly. This was the picture called, "When the Day's Work is Done." I believe a great many pictures originate in the same way, of which more in the next chapter.

PRINTING.

BY W. M. ASHMAN.*

THE subject of this evening's lecturette or paper, whichever you prefer to call it, has been entitled, "Printing." The vastness of this subject is, however, far beyond my capabilities, since we find it dating back as an art to a very remote period; my remarks will therefore be confined to that kind of printing adopted by photographers, and known as silver printing on albumenized paper; or what might with truth be designated, "the fugitive photographic printing process."

I do not wish to occupy your time this evening with a lengthy description of all the various methods of printing, photographic or otherwise; neither shall I reiterate all the discoveries which

* Read before the London and Provincial Photographic Association.

led up to their elaboration, as I have little doubt but that our worthy curator, who was the instigator of this effort of mine, will not rest contented until he has made you acquainted with the secret workings of all and every process based on photographic research. Unfortunately for me, there are no secrets attached to this subject which are not known to you all, unless it be that the ordinary silver print is not the most imperishable souvenir of photographic art one can possess.

Example 1.—Here are some samples which speak for themselves. These were all printed on the 19th May last, and the faded ones have been exposed in a damp atmosphere—viz., a cellar; those prints which have not faded have been kept under the ordinary conditions of the atmosphere. You will notice the extraordinary influence of damp on these prints.

The subject, then, we have to deal with to-night is the means employed to obtain positive images on a suitably prepared surface of silver chloride, incorporated in albumen, by the direct action of light, and if you will allow me, I will deal with this matter in successive steps.

If we expose ordinary white paper to the sunlight, no change is seen to take place; neither should we notice much difference if we soaked a piece of pure Swedish filtering paper in a solution of pure nitrate of silver, dried it, and exposed it to light; but if we were to coat the Swedish paper with gelatine, arrowroot, or some similar organic substance previous to silvering it, we should find that the paper would readily darken in the light. From this we gather that an organic compound of silver is formed, which is more easily acted upon by light than a layer of the pure salt would be.

Example 2.—Here are some prints which have been produced on filtering paper soaked in gelatine, and silvered in the ordinary manner.

Chloride of silver behaves in a somewhat similar manner to nitrate when exposed to light in the presence of organic matter, excepting that chloride of silver is more sensitive; for this reason, as a sensitizing salt for making prints, it has long been the photographer's sheet anchor. If I may be allowed to speculate, I would say that chloride of silver will in all probability be the printing process of the future; not in combination with albumen, however, but a mixture of gelatine and collodion on a sulphate of barium surfaced paper. At no distant date I shall endeavour to show you some examples printed as I have indicated.

Example 3. —In this tube we have a solution of silver nitrate in water; you will notice it is quite transparent. I will add a few drops of hydrochloric acid, and immediately a copious flocculent precipitate of silver chloride is formed. If I wash some of this chloride of silver, and expose it to light, it readily darkens. The same also happens when a soluble chloride, such as common salt, is added. I will take one of these tubes, containing silver chloride, and expose it to burning magnesium ribbon. You will notice it has darkened considerably.

For the purposes of printing, we find it more convenient to form our silver chloride in a very much finer state of division on the surface we intend to act on as a base for the picture, and chemical decomposition is resorted to for the attainment of that end, but not quite in the same manner as I have just shown you. A given proportion of one or more of the soluble chloride salts is incorporated in the albumen coating given to the paper. When this salted albumenized paper is floated on a moderately strong solution of silver nitrate, the soluble salt becomes changed, and an extremely finely-divided layer of silver chloride results, the coating of albumen being rendered insoluble, or coagulated by the silver nitrate.

In this tube I have some white of egg (albumen); upon the addition of a small quantity of this silver nitrate solution, you will notice a white cloud formed; this is coagulated albumen.

Dilute silver solution does not coagulate albumen perfectly; for this reason stronger solutions are used than would otherwise be necessary. When weak solutions are used, portions of albumen will be dissolved, producing an effect called stripping, and may be recognized by a semi-opaque scum floating on the surface of the sensitizing bath; also dull patches and streaks on the paper itself.

Example 4.—Here are some examples of albumenized paper which have been floated for the space of three minutes each on silver solutions of six grains, nine grains, and twelve grains per ounce respectively, fuming thirty minutes. It will be noticed that the 9 and 12 grain examples are very good, but those on 6 grains have very little albumen left. Nearly all the paper used by silver printers throughout the universe is manufactured in the south-east of France, or in Saxony, and is designated, according to the mill from which it issues, either Saxe, Rives, or Renat "New Rives." These papers are sent out sized, ready for albumenizing, which latter operation is performed very extensively in this country and in Germany. Each albumenizer has his own pet formula, and some degree of secrecy is observed by them all. The formula here appended is a fair specimen, and yields excellent results. To every gallon of fresh albumen, free from yelk or germ, add the following:—

Ammonium chloride	... 1½ ounces
Barium chloride	... ¼ ounce
Glacial acetic acid ...	... ½ „
Soft water previously boiled ...	... 4 ounces

When dissolved, add gradually to the albumen, beating constantly until the whole is a froth; after twenty-four hours' subsidence, the mixture may be strained through fine cambric, and is ready for use, Coating is performed by floating the smoothest side of the paper on the albumen bath for the space of thirty or forty seconds according to the nature of the paper; the sheet is then dried on laths or rods at a temperature about 90° F. In Germany the sheets are pinned up by two corners to dry. The coarseness of texture sometimes noticed in silver prints is due to the paper being coated on the wrong side. Drying at too high a temperature gives a brilliant surface, but causes blistering in the after process. Drying at too low a temperature causes dullness. The quantity of albumen required to coat a ream of paper weighing 10 kilogrammes will be about 2 gallons. Various tints may be given to the paper by the addition of suitable liquid dyes mixed with the albumen. Albumenizing and sensitizing cannot at present be successfully performed at one operation; as far as experiments have been made, all attempts to preserve the paper have failed, and the results have not proved satisfactory. Sensitizing, therefore, becomes a distinct operation. I may fairly assume that many present indulge in the luxury of ready sensitized paper; still I have taken the liberty of introducing this subject as one of the stages necessary to obtain a result. Silver nitrate and sodium chloride, if permitted to attack each other in the presence of water, form, as everybody knows, silver chloride and sodium nitrate. In practice it is not necessary to deal with exact equivalent proportions, it being sufficient to ensure an excess of silver nitrate strong enough to prevent stripping, and not strong enough to produce bronzing of the shadows to any appreciable extent. It has been pointed out in "Text-Books," "Lessons," and other places, what happens when silver chloride is exposed to light, and no doubt you are all familiar with the reaction from a practical point of view. We will suppose we are using a paper salted as above mentioned, viz., a paper coated with 6 grains of soluble chloride per ounce of albumen. We should make up the sensitizing bath at least five or six times that strength, say 40 grains of silver nitrate per fluid ounce of water. Half a gallon of this solution would give us a bath on which half a quire of paper could be sensitized. It would then be necessary to replenish with more silver, as about 290 grains of silver nitrate would have been converted into chloride, or absorbed in the paper. Other nitrates with silver are used by some printers, the principal being the nitrates of soda and potash. They are said to effect a saving of silver, but they are seldom used by practical printers. I have appended a formula which has worked well in my hands:—Nitrate of potash 35 grains, nitrate of silver 30 grains, water 1 ounce.

The time required for floating on such a bath will be from six to eight minutes, and ammonia fuming will be found advantageous when good results are desired. There is really no distinct advantage gained by the addition of any other substance to the silver solution. In proof of this statement, I now show you untoned prints sensitized on the following:—

Nitrate of silver	... 10 grains
Nitrate of potash	... 10 „
Sugar-candy	... 10 „
Water	... 1 ounce
Also	
Nitrate of silver	... 5 grains
Nitrate of potash	... 5 „
Sugar-candy	... 5 „
Water	... 1 ounce

The results are very little, if any, better than the prints shown from a weak, plain silver bath.

(*To be continued*).

Correspondence.

HYDROKINONE DEVELOPER.

SIR,—From what Mr. Pocklington says, I imagine his experience of his developer is in portraiture. I have attempted landscape and marine subjects, the latter instantaneous (so-called), with the result I stated: that I lost a great deal more in fixing with hypo. of the full strength, than I did with pyro developer, and consequently had a thin negative requiring intensifying. As a very old photographer, I am not given to under-development, and in the cases referred to the development was carried so far as to give a deep brown tint to the transparent parts of the negative, which cannot be wholly removed by clearing solution. I thank Mr. Pocklington for his formula, which I think the best of several I have tried. I may add, that so far as I have gone with hydrokinone, I believe it to admit of shorter exposure than any other developer I have used, and am consequently desirous of continuing to use it.—I am, sir, yours truly, G. ST. J. B.

PHOTOGRAPHY IN THE ULTRA-RED REGION.

SIR,—In reference to your note on page 25 of last week's NEWS regarding the interesting work of M. Henri Becquerel, permit me to say that several of the lines in the infra-red region of the spectrum due to metallic vapours were first noted by me in a paper to the Royal Society in 1881, and that many more have since been mapped by me from photographs. The absorptions by liquids in the same region can also be found in the Phil. Trans. of 1882 in a paper by Colonel Festing and myself. M. Becquerel's method of observation is most ingenious, but photography leaves it far behind, both for detail, sharpness, and, I may add, accuracy. With photography, the use of the high dispersive power of a closely-ruled grating is easy, whilst with phosphorescence the dispersion employed is of necessity small.—Yours faithfully, W. DE W. ABNEY.

A MODIFIED FERROUS-OXALATE DEVELOPER.

SIR,—Amongst many modified ferrous-oxalate developers I have experimented with during a prolonged series of experiments with developers in general, the following promises so well that I venture to ask you to allow me to submit it to your readers.

To one ounce of the usual ferrous oxalate developer add one drop of a saturated solution of biehloride of mercury. Fully, but not over-expose, and develop as usual. Wash well, and fix. The colour of the negative or transparency is a rich full black with clear shadows. For lantern transparencies on slow plates, the developer has in my hands given most excellent results.

I defer any statement as to the results obtained with other chlorides to a later period. HENRY POCKLINGTON.

HOW ENLARGEMENTS ARE SUPPLIED TO CO-OPERATIVE STORES.

DEAR SIR,—I am informed that a large wholesale firm of dealers in photographic materials has entered into arrangements with a well-known Co-operative Stores to supply them with finished enlargements, which are retailed by the Stores at an advance of 4s. on the wholesale price charged to the members of the profession. Now I should like to ask the profession, if they think that a wholesale house is acting fairly by them in thus indisputably taking away their most profitable work?

If my information be correct, I should surmise that photographers will not care to deal with those who, not satisfied with doing a wholesale business, seek to undersell the whole profession in this, and I firmly believe in every other branch of our business.—I am, dear sir, yours obediently, X. Y. Z.

January 12th.

GELATINO-STARCH EMULSION.

SIR,—In M. Vidal's letter in your last issue, I note that M. Audra has been experimenting with a gelatino-starch emulsion. In some experiments made about a year ago, I found that while the replacement in a gelatino-bromide emulsion of half of the gelatine by a small proportion of starch did not affect the sensitiveness, the resulting films were capable of being fixed and washed as quickly as those of collodion. I think, however, that for ordinary purposes, starch cannot be employed, as the "ground glass" appearance referred to by M. Audra always occurs in the resulting negatives. This granularity is due, no doubt, to the fact that starch paste is not a solution, but a suspension in water of the swollen granules.—Yours, &c.,

ARNOLD SPILLER.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

At a meeting of this Society held on Thursday, the 10th inst., Mr. W. K. BURTON in the chair,

The CHAIRMAN, in a few introductory remarks, called upon Mr. W. M. Ashman, to deliver his lecturette on "Printing," this being the fourth of the series announced to be given at regular intervals (see page 42.)

The discussion on the subject was opened by the Chairman. He did not think any one believed preserved paper gave better results than freshly prepared, or as good. In common with many amateurs, he tried the method spoken of by the lecturer, and most or all of the published methods, but could not equal freshly prepared. In testing commercial papers, he could not get a trace of acid, and must say the secret of manufacture was well kept.

Mr. W. E. DEBENHAM considered it strange the secret should be kept back so long. Did Mr. Ashman fume the paper preserved on the bath recommended? In his experience, fumed paper discolours in the frames more readily than unfumed. Had the Chairman tried the perchloric acid method? It does not require fuming, is not acid, and will keep a year, giving a passable print not quite equal to freshly prepared paper.

The CHAIRMAN had not tried perchloric acid; he thought any volatile acid might answer.

Mr. F. YORK found many advantages in having a stock of sensitive paper always at hand. His practice was to stop printing on Saturdays, and make a stock of paper on that day. The paper is floated three minutes on a 60-grain neutral silver bath, followed by floating one minute on a 30-grain bath containing 5 grains per ounce of citric acid. There is no loss of silver in the second bath, but there is a loss of acid; for this reason he added 1 grain acid solution when required. The paper keeps a month; there is no difficulty in toning; if the prints were immersed, before toning, in a soda solution, 1 ounce to each gallon of water, he did not find fuming necessary.

Mr. A. L. HENDERSON disagreed with the lecturer on some points. He did not think there would be any gain in the proposed adoption of gelatine and collodion instead of albumen. Dr. Vogel, Mr. Cowan, and he (Mr. Henderson) had experimented in that direction. If the lecturer had gone a little further with his experiments, and saturated the five-grain silver solution with nitrate of potash, and fumed the paper, he would get rich prints and perfect coagulation of the albumen. In answer to Mr. Debenham, he found perchloric acid wanting. What was really required was a paper which, when preserved, can be worked in quantity as well as it does in an experiment with a few prints. He had succeeded very well with oxalate of ammonia and honey. In his experience, fumed paper kept better than unfumed. Paper could be preserved with as little as $\frac{1}{300}$ of a grain of citric acid per ounce.

The CHAIRMAN had no difficulty in working preserved paper in quantity.

Mr. W. M. AYRES showed some prints in fine condition toned by him twenty-two years ago by the lime and gold toning bath, the lime being in the proportion of 2 to 1 of gold; the fixing bath being 1 of hypo to 20 of water.

Mr. J. T. TAYLOR said it was due to Mr. Ayres to mention that he gave him some prints about that time, which are, at the present moment, about the best he possesses. Perhaps Mr. Ayres will say how he produced them?

Mr. AYRES said that the prints mentioned were toned and fixed at one operation—*i.e.*, the old hypo and gold process.

In the course of a general discussion on the merits of alkaline toning *versus* hypo and gold,

Mr. YORK said the uncertainty of the old process was due to continuing the toning action after the gold was exhausted, thereby toning by sulphur. The proper way to mix the bath is to dissolve 1 part of hypo in four parts of water; then add gold terchloride gradually to it.

Mr. F. W. HART was of Mr. York's opinion. If photographers would stick to fresh hypo, there would be less fading. He made it a practice to use a pint of every solution per sheet of paper. After several changes of water, the prints were passed through the eliminating solution, washed again, and dried, the whole operation occupying less than four hours.

Mr. W. T. WILKINSON adopted citric acid for preserving paper in India; when the air was very dry, he resorted to fuming.

Mr. W. H. PRESTWICH said no difficulty existed in toning preserved paper, if the prints are soaked in washing soda, as mentioned by Mr. York.

Mr. HENDERSON, referring to the sel d'or bath, said he used to put his prints into salt and water without washing, then into the hypo, and tone them afterwards; the results were more permanent than the present system.

Mr. W. COLES thought the discussion had not been confined to the subject, which did not include toning and fixing. He should like to ask the lecturer how best to vignette an under-exposed negative, and the best way of softening intense shadows; he used a board suspended from a roasting jack to get good blending.

Mr. ASHMAN, replying to Mr. Debenham, said he fumed the preserved paper before printing. Under ordinary circumstances, fumed paper would keep longer than unfumed. Replying to Mr. Cole, he said the distance between the opening and the negative would determine vignettes being well graduated or not. Under-exposed negatives requiring greater distance than those properly exposed, any semi-opaque colour could be applied on the back of the negative to block the intense shadows; tissue paper answered, so also would black varnish applied with an old stencil brush.

Mr. HENDERSON showed three negatives to illustrate the gain in speed of Mr. H. J. Newton's sal. soda developer with the mercuric iodide added, as already published. No. 1 plate exposed 2 seconds; No. 2, exposed 4 seconds; No. 3, exposed 4 seconds. No. 1 was quite equal to Nos. 2 and 3. They were developed as follows:—No 1. Ordinary sal. soda developer. No restrainer. 3 drops of mercuric iodide added. No. 2. Ordinary sal. soda developer. No restrainer. Without addition. No. 3. Ordinary ammonia pyro and potassium bromide. He considered the gain at least two to one.

Mr. HADDON asked if iodide of potassium alone would not answer as well. In developing gelatino-chloride plates with Dr. Eder's formulæ, if iodide of potassium is substituted for common salt, the image develops in a few seconds, instead of ten or twelve minutes.

Mr. HENDERSON had used a good deal of carbonate of ammonia in making emulsions lately. When filtered through wash leather, nothing particular was noticed, but if not passed through leather, there was a very fine sandy deposit. In the example shown, half the plate showed green fog; the other portion had been removed with hydrochloric acid and alum; the deposit could be distinctly seen in both portions.

A vote of thanks having been passed to the lecturer, it was announced that the next lecturette will be given by Mr. F. W. Hart, F.C.S., on "Residues," February 14th; the following by Mr. T. Bolas, F.C.S., on "Phototype Printing," March 13th.

PHOTOGRAPHIC SOCIETY OF IRELAND.

THE usual monthly meeting of this Society was held in the Royal College of Science, Stephen's Green, E., Mr. GREENWOOD PIM in the chair.

The minutes of the previous meeting having been read and confirmed, Messrs. Joseph Dollard, William Rigby, J. C. King, and P. Crosthwaite were elected members.

Mr. COWAN gave a most interesting account of his late visit to the Photographic Society of Great Britain's recent exhibition. He also passed round a number of copies of photographs there exhibited, those of Professor Donkin's Alpine views being particularly beautiful.

In the discussion which followed, Dr. PEARSALL thought that amateurs, as well as professionals, might learn a great deal from colour artists, in the way of producing picturesque as well as really artistic pictures, for, as he remarked often, by shifting the camera a little to one side or the other, and by using a little judgment in the choosing of the subject, very much better pictures would more often be seen than what we are accustomed to.

Mr. WATSON exhibited Messrs. Atkinsons' new camera and instantaneous shutter, which was kindly lent for the occasion.

The next meeting is intended to be held on February 8th.

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

A MEETING was held in the Religious Institution Rooms on Tuesday, January 8th, Mr. HUGH REID, President, in the chair.

After the reading of the minutes, the following new members were admitted:—Messrs. Ross, Wingate, Horsefield Bannerman, Barr, Smillie, Percy, and McKenzie.

Mr. W. SNELL ANDERSON was called upon to give a demonstration of enlarging on argentic gelatino-bromide paper. He employed an optical lantern fitted with a double wick lamp, and made two successful enlargements from half-plate negatives. The demonstration was watched with interest by a large attendance of members.

Mr. PARKER was then called to explain his sky-shade, which he said he had pleasure in doing on this occasion in order to call attention to an improvement that had been made on it by Mr. Skinner. The improvement consisted in replacing the brass collar fitting the hood of the lens, by a strong rubber band, by which means the shade could be fixed to any size of lens.

In reply to the President,

Mr. PARKER said that the exposure when using the shade was about doubled.

The PHOTOGRAPHIC NEWS and *British Journal* annuals, presented by the respective Editors, were laid upon the table.

It was intimated that at the February meeting Mr. T. N. Armstrong would give a demonstration of transparency printing and mounting on glass.

Votes of thanks having been awarded to Messrs. Anderson, Parker, and the Editors of the annuals, the meeting adjourned.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE third meeting of the session was held on Monday, 7th January, Mr. WILLIAM NEILSON, President, in the chair. The room was inconveniently crowded, between eighty and ninety members being present.

The minutes of the last meeting having been passed, the following were unanimously elected ordinary members:—Messrs. W. Adams, H. B. Melville, William Peek, William H. Muir, J. Clinton Nott, William Meikle, James Lessels, W. Cuthbertson, Andrew Paterson, and Miss Ann C. S. Calder.

Mr. H. H. PILLANS proposed:—That the Council be empowered to extend a sum, not exceeding £5 every year, in purchasing books towards forming a library for the Society. That the Council may suspend this payment any year they may think that the funds of the Society do not warrant such expenditure. That the Council determine what books shall be purchased, where kept, and how made available to members.

Mr. FRASER suggested that the Secretary might communicate with other societies in Edinburgh to bring about united action for the securing of suitable rooms where various bodies might hold their stated meetings, with accommodation for books, apparatus, &c., and a permanent caretaker.

Ultimately it was agreed, on the motion of Mr. J. HENDERSON, that the question of the rooms, &c., be referred to the Council with full powers.

Mr. HUME NISBET then delivered a lecture entitled "Camera-Lucida—Paletta Obscura: The Union of Painting and Photography" (see page 38). Mr. Nisbet illustrated his remarks by a number of photographs from various sources and by rapid charcoal sketching. The lecture was listened to with marked attention, and the beautiful word painting elicited frequent applause.

At its conclusion, the PRESIDENT said the Society was much obliged to Mr. Nisbet for his interesting and practical address, which was both instructive and suggestive. In some respects, however, he differed from what had been advanced. He was afraid that the painter who relied on photography would find that it tended to interfere with the freedom of his brush, and conduce to a mere hard rendering of details. Photography had its own province in black and white; but coloured canvas involved a different principle—the principle of selection. The

details of nature were grand by their dimensions; but if these were crowded into a small canvas they became paltry, not conveying a feeling of nature. The business of the painter was not to give a paltry imitation of nature, but to translate nature into art, by missing out non-essential details so as to enhance the leading features of the scene on which its character depended.

Mr. J. G. TUNNY said the meeting could not separate without according to Mr. Nisbet a hearty vote of thanks for his most interesting and instructive lecture. There must be few, if any, in the audience who had not felt their souls stirred by the graphic word-pictures that had been presented. The perusal of the lecture, he hoped, would make every photographer proud of his art, and awake in each a stronger ambition to realize the ideal he had placed before him; and he hoped it would also have the effect of lessening the unconcealed prejudice that is sometimes evinced against the productions of the camera by those who use exclusively the palette and the brush.

Dr. THOMPSON seconded the motion, which was carried with applause.

Mr. J. M. TURNBULL exhibited an ether generator, and Dickson's improved burner for the lantern.

Mr. J. CRIGHTON exhibited a large collection of photographs by Mr. Foster, of Coldstream. These were hung round the walls of the room, and were examined with great interest, Mr. Nisbet making use of many to illustrate his lecture.

A number of photographs by Messrs. Crighton, Matheson, Murray, and Dr. Sidey were distributed by ballot.

The attention of members was directed to the first "Popular" meeting, to be held on Wednesday, 23rd inst., and members were requested to send in their transparencies to the curator or secretary as soon as possible. None would be exhibited received after the 19th inst.

After a hearty vote of thanks to Mr. Turnbull, Mr. Crighton, the contributors to the ballot, and the chair, the meeting adjourned, to meet again in 5, St. Andrew Square, on Wednesday, 7th February.

HALIFAX PHOTOGRAPHIC SOCIETY.

THE monthly meeting of this Society was held on the 8th inst., Mr. BIRTWHISTLE in the chair.

After a lengthy discussion, it was unanimously decided that the proposed exhibition should be held as early as arrangements could be made, and a committee of management was appointed to settle all details.

The question-box was found to contain the following query: "The opinion of the Society is solicited as to the relative merits of ferrous oxalate on the one hand, and alkaline pyrogallic on the other, as developers, more especially bearing on the latitude each afforded for meeting the extremes of over- and under-exposure?"

Mr. Illingworth, Mr. Davis, and Mr. Smith (of Sowerby Bridge), in offering their opinions as professionals, concurred in giving preference to the alkaline pyro. developer, their experience being that if the exposure was not finely hit upon there would be a great difficulty in producing a good negative, and the loss of time involved under such circumstances meant to the professional money as well as inconvenience. When a plate required forcing, the results would be harsh and hard. Mr. Illingworth, however, found a great improvement in results, and a considerable lessening of this evil, when forcing had to be adopted, by reducing the ferrous salt and increasing the oxalate of potash. He was also under the impression that, up to a certain point, an under-exposed plate developed quicker with ferrous oxalate than with pyro., but beyond this much slower, and, as far as latitude was concerned, pyro. held the palm when taken as an all-round developer.

Mr. J. E. JONES believed that when strong contrasts of light and shade were desirable—"à la Rembrandt" for instance—ferrous oxalate was the best, but pinned his faith to pyro. for general purposes.

Mr. GLEDHILL liked pyro. best because of the greater latitude it afforded by modification, but when good blacks were required, as in the case of transparencies for the lantern, then ferrous oxalate was to be recommended.

Mr. BULMER had heard a deal said about pyro. staining, but he could get as clean and bright negatives with pyro. as it was possible to do with ferrous oxalate. Most advocates of the iron developer referred to the staining question as being an evil inseparable from the use of pyro. Stains could be produced with any developer if not used intelligently. He was not prejudiced against ferrous oxalate, but preferred pyro. on account of the great power it afforded for regulating the character of negative.

Mr. Councillor SMITH well knew there would always be exponents of, or partizans of, both sides of the pyro. and iron question, and it was only natural that parties should uphold and praise the one that pleased them the most. He would point to the striking fact that on the Continent ferrous oxalate reigned supreme as a developer, being used daily by a large body of workers eminent in their profession, and there could be no question that France, Germany, and Italy could compete favourably with the very best results produced in England. He was sure the iron developer was but imperfectly understood on this side of the Channel. One of the chief causes of failure was owing to development being stopped too soon; he always allowed it to proceed until all trace of a picture had become lost to sight when viewed by reflected light; in fact, the plate should appear "dense to blackness." When fixed, such pictures would be found to possess all the qualities necessary for a good negative. Possibly many who tried the ferrous oxalate developer in its early days condemned it without sufficient trial, and he ventured to think that if it had received the same amount of study or attention conferred upon pyro., it would to-day have held the place of honour in the first rank of developers. As regards latitude, he claimed for it anything that could be conceeded for the alkaline method. Dr. Eder, and other eminent scientists, distinctly stated that any amount of latitude was obtainable, and if he (Mr. Smith) erred in this, his own views of the question, he did so in good company. Dr. Eder's formula for his concentrated iron developer gave as much latitude for forcing as ammonia did, and that without its drawbacks. He remembered the suggestion thrown out some time ago by Mr. Williams, that two plates should be selected of exactly the same description, and exposed under the same conditions—or, rather, under-exposed—and then developed with iron and pyro. respectively. He thought this would prove of practical value if followed; the result, he was sure, would remove much misconception. The proportion he generally adopted was 1 part of iron solution to 4 parts of oxalate of potash solution, varying it at times to 1 to 3. He began development by using very little iron, gradually adding more as the action proceeded, removing the plate as each addition was made. For bromo-argentic paper, he used ½-ounce of iron solution to 3½ ounces of the oxalate, the whole added to about 24 ounces of water. Referring to Mr. Gledhill's remarks, he thought the colour of a transparency depended as much on the character of the plate as on the developer. He had obtained beautiful warm browns with ferrous oxalate. He had tried Newton's washing-soda developer, but had not succeeded in getting negatives free from a general yellow cast of stain, which deepened if any forcing was resorted to.

Mr. BIRTWHISTLE agreed with all Mr. Smith had said in favour of the iron developer. It was a magnificent discovery, and, he believed, the developer of the future. He had never found it weak, although he used only one part of iron solution to eight of oxalate. He liked slow development, and often got the best results by first bringing out the details with an old and previously used developer, and finishing off with a new one. He believed the real meaning and bearing of a "saturated" solution was only imperfectly understood, and did not think the mere dissolving the oxalate or iron until crystals remained deposited, was a saturated solution giving the greatest concentrated developing energy possible. The addition of citric acid was a grand step forward, altering all this wonderfully. If both solutions were not properly saturated, a precipitate would be the result directly they came together, which would detract from its developing power.

Mr. W. C. WILLIAMS, while acknowledging he had not given Dr. Eder's latest formula a trial, and conceding a high place to the iron developer, still felt bound, by his past experiences, to give his verdict in favour of alkaline pyro. He agreed with the previous speakers who attributed a greater latitude to pyro., but although this was a great power to recommend a system, he was afraid undue prominence had been given to it. He believed that iron had a stronger proportionate affinity or energy for developing the higher lights, and rapidly bringing these out, than for parts acted upon more feebly by light, and consequently a want of roundness and softness follows its use. With pyro., the case being different, the high-lights and deep shadows are brought forward more regularly, and in harmony with one another—this irregularity of action or special affinity being marked in other chemical operations in connection with photography. He quite agreed with slow development, and this was his invariable rule, but always liked to complete development on the same day of the month it was commenced, which did not happen on one occasion when using ferrous oxalate. When using pyro., and under-exposure was suspected, a preliminary soaking of the plate in a 4-grain solution of pyro. having the least possible trace of

ammonia, but no bromide, previous to the development proper, would be found advantageous at other times. Soaking the plate in ammonia solution, and after washing in pyro. with a trace of bromide, is another good plan. For many years he had used glycerine and water to soak plates in for about ten minutes before developing, which prepared it for the even and rapid action of the developer, and so prevented any undue proportion of ammonia being used.

The thanks of the Society was then passed unanimously to the PHOTOGRAPHIC NEWS and YEAR-BOOK, also to the proprietors of the *British Journal* for the gift of Year-Book and Almanac, and a very interesting meeting was brought to a close.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.

THE annual meeting of the above Association was held in the College of Physical Science, Newcastle-on-Tyne, on Tuesday, the 8th instant, Mr. JAMES DOWNEY in the chair.

The third annual report was read by the Secretary as follows :—

Your Council have pleasure in offering to you the third annual report. The past year has been a busy and prosperous one. Since the last report was issued, four members have resigned, and five names have been removed from the books. The Society now numbers 81 members. Eleven gentlemen have joined during the year. The ordinary monthly meetings have been well attended. Four out-door meetings were held, and were very successful; Mr. Maling's kind offer of a medal contributing largely to this result. Three practical demonstrations have been given, and two lantern demonstrations. These were highly appreciated. The success of the Society's exhibition, held in the Central Exchange Art Gallery, was well assured—the list of contributors containing, as it did, the names of numerous well-known prize-winners. The Exhibition was highly spoken of by the local press and by the photographic journals. The best thanks of the Association are due to the Council of the College of Physical Science for placing their rooms at our service; to the Rev. T. F. Hardwich, Messrs. Edgar Goold, Thomas M. Laws, J. B. Payne, J. Pike (two), Lyddel Sawyer (two), and A. A. Campbell Swinton for the contribution of papers; also to the President, Mr. R. Jobling, and Mr. George Spruce for acting as judges at the Exhibition. Your Council trust that a liberal supply of papers will be forthcoming at the ensuing meetings, and rely on your generous support and assistance.

The TREASURER (Mr. P. M. Laws), on presenting the financial statement, said it was satisfactory, considering the severe strain there had been upon the funds, to be able to show a balance on the right side at all. Not only had the expenses incidental to the Exhibition to be met, but the presentation prints for the preceding year had to be paid for. To defray the cost of the latter alone the balance of 1882 was reduced to less than five pounds. The entire cost of the Exhibition was £31 1s. 5d., and when the sum realised by advertisements in the catalogue was deducted, the actual disbursement for the Exhibition was £24 8s. 4d. As a set-off against these two items in the balance sheet, each member received, for 1882, a print nearly, if not quite, equal in value to his annual subscription; whilst for last year members received an exhibition ticket entitling them to a fortnight's free admission to the Art Gallery. The balance-sheet shows an advance of eight subscriptions over last year; and three more were received after the accounts were audited. There were still, however, six subscriptions in arrears. All things considered, the Association was financially in a very satisfactory position, there being a small balance on the right side.

The reports were favourably criticised and unanimously passed.

Mr. J. P. GIBSON proposed in eulogistic terms a vote of thanks to the Secretary and Treasurer.

After remarks by Mr. Sawyer and the Chairman the vote was carried with acclamation, as were also thanks to the President, the Auditor, and the Exhibition Sub-Committee.

The CHAIRMAN presented to the Association, on behalf of Colonel Sheppee, a handsome portfolio.

The SECRETARY was requested to convey the thanks of the Association to Col. Sheppee for his useful and much-wanted gift.

The scrutineers (Messrs. T. M. Laws, Ridley, and Gray) appointed to examine the voting papers reported the result of their investigation as appended :—

President—Col. Sheppee.

Vice-Presidents—Prof. A. S. Herschel and Prof. P. Bedson.

Hon. Treasurer—Mr. P. M. Laws.

Council—Messrs. Auty, Dodds, Downey, Gibson, Goold, Galloway, Payne, Maling, Ridley, and Sawyer.

Hon. Secretary—Mr. J. Pike, 11, Grey Street, Newcastle.

Auditor—Mr. E. Schnmann.

In accordance with notice given at the previous meeting, the HON. SECRETARY moved to alter rule 61 by making the subscription for ladies 5s. per annum, and said that his object was to increase the number of members, to assist the funds, and to make the Association more social in character. Of course such lady-members would receive presentation prints and be on the same footing as other members, except with regard to holding office. The motion was, after some little discussion, passed.

The adjourned discussion of Mr. A. C. Swinton's paper, entitled "The Past, Present, and Future of Photography in Natural Colours," read before the Association December 11th, 1883, was opened by the SECRETARY, and was sustained with much animation by Messrs. Gibson, Downey, Pae, Sawyer, Laws, Swinton, and other gentlemen. At the suggestion of Mr. J. P. Gibson the discussion was again adjourned, pending the result of some promised further discussion.

LEEDS PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting was held on January 10th, at the Philosophical Hall.

Professor THORPE, F.R.S., occupied the chair, and in the course of his presidential address, said that the extraordinary development of photography in these latter-day dry-plate days, and the extent to which the art was intelligently practised by scores of people to whom it was the chief occupation of leisure hours, seemed to many sufficient reason for the establishment of a Photographic Society. Leeds was among the earliest of the towns in which the process of Daguerre gained a habitation. To the late Mr Huggon must be given the credit of being the first resident portrait photographer in the town. That gentleman taught and spread a knowledge of the process. More than thirty years ago a small band of enthusiastic workers, including Messrs. Wm. Fieldhouse, Wm. Gardham, Wm. Halliday, Thos. Briggs, Thos. Dixon, Thos. Hope, R. J. Fowler, Wm. Pumphrey (of York), and Henry Brady, F.R.S., centred round the vice-president (Mr. J. W. Ramsden), and, thanks to his liberality, the Yorkshire College possessed a number of the results of the efforts of the first Photographic Society of Leeds. This Society seemed to have been comparatively short-lived, and to have become merged in a general scientific society. The photographic section of this Society lost its independent existence on the creation of the Photographic Society of London. Under the leadership of Mr. Teasdale, the Leeds Society was resuscitated about two years ago as a section of the local Natural History Society, and from that had sprung the present body. Of the vitality of this organisation the newly-elected President had little doubt. Its members already numbered more than fifty, and included most of the best-known amateur and many leading professional photographers in the district. Having given this brief sketch of the rise and progress of photographic societies in Leeds, Professor Thorpe delivered an interesting address, whose object was to further the scientific and experimental side of the art, and to show how fruitful and promising is this department of chemical-physics. There was much in the early work of photography which, read in the light of to-day, merited intelligent examination. Many of the earlier methods were still worthy of attention; indeed, some of them were capable of affording results which, in point of artistic merit and technical excellence, were hardly surpassed by the productions of our modern processes. Any association that would make pretensions to be a photographic society in a real and complete sense should never lose sight of the fact that, of all the pictorial arts, photography had the most direct and immediate connection with physical science. Photography was essentially a branch of applied chemistry and physics. Everybody recognised this, yet little was done towards the solution of many of the problems which were essentially connected with the scientific or theoretic side of photography. For example, practically nothing was known beyond the fact of the phenomenon that a gelatino-bromide plate, after exposure, will, if kept in the dark, gradually lose the impress which is called the latent image. There was in fact, no lack of questions relating to the scientific, and especially the chemical side of photography, many of which might be answered by systematic experiment. There was the perennial question of canary *versus* ruby medium, the influence of thick and thin films of gelatine, and the causes which determine the deterioration of plates. After giving other instances wherein experiment and research might be rewarded, the President pointed out that the number of scientific workers in photography

was really very small. The field was still open, and rich in promise to the intelligent worker. In no branch of science could results be more easily got; the returns and the profits were equally quick and great. Some there were who looked upon photography as a mere pictorial art, and had scant sympathy with the scientific aspect of their work. To these gentlemen the Society was ready to give every appreciation, while welcoming among them all who were willing to contribute to the systematic and scientific development of the art.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE deferred annual meeting was held on Saturday, December 1st, at the Association's Studio, Portland Street, Kingsdown, Mr. T. DAVEY, vice-president, in the chair.

The previous meeting's minutes having been confirmed,

The TREASURER (Mr. C. Brightman) read the accounts and balance sheet, which showed the Association to be in a healthy financial condition.

The HON. SECRETARY (Mr. H. A. Hood Daniel) stated that the next business was the election of officers.

Col. PLAYFAIR suggested that it might save time to re-elect all the officers together; but as there seemed to be a feeling that it would be better to elect each officer separately, that plan was adopted, with the following result:—

President—Mr. T. Davey.

Vice-presidents—Rev. W. J. Whiting and Col. Playfair.

Treasurer—Mr. E. Brightman.

Hon. Secretary—Mr. H. A. Hood Daniel.

One of the existing vacancies on the council was filled by the election of Mr. J. Phillips.

The meeting then formed itself into committee, and discussed the extensive arrangements requisite to be made for the successful carrying out of the International Photographic Exhibition, with regard to which the report given by the Hon. Secretary was of a very satisfactory nature, especially with reference to the foreign exhibits, and the gentlemen who had kindly signified their willingness to act as jurors.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN. — The next mid-monthly meeting of this Society will take place on Tuesday next, January 22nd, at 8 p.m., at the Gallery, 5A, Pall Mall East.

A PHOTOGRAPHIC ACTION.—At the Metropolitan County Court of Bloomsbury, on the 15th inst., the case of Ashber *v.* Clark was heard before Mr. Judge Bacon, the plaintiff and defendant being both photographers. The action was brought by the plaintiff to recover the sum of £12 15s. under the following circumstances. From the plaintiff's evidence, it transpired that in May, 1882, he lent the defendant, who was anxious to take some large heads, a camera with lenses for that purpose, and although he had made repeated applications to the defendant for its return, he had failed to obtain it, and, in consequence, was obliged to bring the present action to recover its value. In reply to the learned judge, the plaintiff said that the camera originally cost him £12 10s., but he had expended more money on having extra fronts to receive other lenses for it. The plaintiff's solicitor produced letters written by the defendant promising to return the camera in June last, but he had never done so. The plaintiff said, in consequence of the inconvenience he had been put to, he had to purchase another instrument, which cost him £9 10s. He was of opinion that the defendant had pawned the camera, and he offered to redeem it if he would give him the duplicate, but he could not obtain even that. At this stage of the case, the learned judge said the plaintiff was clearly entitled to judgment for the full amount claimed, with costs on that amount. Judgment was entered accordingly.

THE ALLEGED DECOMPOSITION OF PHOSPHOROUS ANHYDRIDE BY SUNLIGHT. - Messrs. Cowper and Lewes have made a series of experiments which lead them to conclude that the results obtained by Irving are consequent upon the use of an impure phosphorous anhydride, it being apparently contaminated with minute crystals of phosphorous; and the darkening observed on its exposure to light doubtless arises from the conversion of this phosphorous into the amorphous variety.

PHOTOGRAPHIC CLUB.—At the next meeting of this Club, on Wednesday, January 23rd, the subject for discussion will be "On the Preparation of Cloud Negatives, and Using Them."

To Correspondents.

MAJOR-GENERAL P.—1. Gas or candle flame may very well be trusted for sensitizing. Thank you for suggestion, which we will certainly act upon.

CHAS. G. WILLIAMS.—A method based upon the principle you refer to is not likely to prove satisfactory, but you may gather all the information you desire from an article on page 402 of our last volume.

STAINS.—It seems to us that it is a consequence of an inequality in the albumen coating. Try another sample of paper.

T. LEWIS.—1. We should advise you not to allow less than an inch between them. 2. They arise from the use of an unsuitable gelatine. Try Nelson's X opaque.

J. H. W. B.—We should advise you to communicate with Captain Abney. A letter addressed to the Science and Art Department, South Kensington, will reach him.

A. G. LEVY.—It has been too long in the developer. You should have given double the exposure.

SOUTH DEVON.—The term is generally applied to gelatine containing a soluble bichromate, such as the bichromate of potassium or ammonium, and we may mention the following as examples of its use. A sheet of gelatine is soaked in a 5 per cent. solution of potassium bichromate until it is flaccid, after which it is carefully laid on a sheet of glass and rapidly dried. Such a film, if exposed under a negative, loses its property of swelling in water where acted upon by light, and if the exposed film is soaked in water, a picture is obtained in relief. Take another example. Six parts of gelatine and one of bichromate of ammonium are dissolved in thirty parts of water by the aid of heat, and a layer of the mixture is allowed to dry on a levelled glass plate. When exposed and soaked, the plate may form the matrix upon which copper is deposited by the electrotype process. Printing plates are often made by methods of this character.

EDWIN GRANT.—About two ounces of water will be taken up by the gelatine, and this will be found sufficient to reduce the emulsion to a convenient consistency for working.

ALFRED M. SHARP.—1. The difference probably arises from the fact that cold solutions soften the gelatine film much more slowly than warm liquids, and, under the circumstances, we should prefer to increase the ammonia rather than reduce the amount of bromide. It is not likely that anything was wrong with the sample of ruby glass, but you probably expected too much of it. You will see a note about the use of cherry fabric and white tissue paper in another part of the NEWS.

F. G. M.—Thank you; we shall be very pleased to see it.

E. WILLIAMS.—Decidedly make a claim upon the publishers. Mention that you have proof which you can supply them with; that the illustrations are taken from your work. You seem to have a very good case.

H. SPINK and W. K.—Mr. Oborne, of Red Lion Square, supplies earthenware washing troughs, grooved.

IRON.—Under the exceptional circumstances to which you refer, we should advise you to make a contact transparency on a gelatine plate, and to intensify this. From the intensified transparency you will obtain a reproduced negative.

R. W.—It is cheaper than the ordinary lantern, but we should certainly not regard it as better.

REV. H. B. HARE.—We have forwarded it.

The Photographic News Registry.

Employment Wanted.

Salesman to photo. & frame makers.—L. W., 18, Plantation-rd, Oxford.
Operator, colourist, &c.—S. George, Sherwood-villa, Brunswick-pk., N.
Neg. Retoucher, lady.—M. F., Gaskell's, 15, Sussex-rd., S. Kensington.
Reception-Room or Shop.—C. M., 2, Dover-ter., Dover-st., Sittingbourne.
Retoucher, Lady, first-class.—E. M., *Photo. News* Office.
Spotter & Mounter.—Miss Stewart, 2, Albany-ter., Bournemouth.
Retoucher & Spotter.—L. F., 30, Swanmore-rd., Isle-of-Wight.
Silver Printer, first-class.—F. G., *Photo. News* Office.
Reception-Room, Lady.—F. W., 16, Chryssell-rd., Brixton.
Retoucher (Lond. only), c/o. J. S. Cockerton, 2, Hanover-pl., Regent's-pk.
Retoucher & Assistant Operator.—Artist, 19, Waterloo-st., Southsea, Hants
Carbon Enlarger, Painter, &c.—G. Fischer, 54, Berners-st., W.
Recep. room and manage (Lady).—Rembrandt, 5, High-st., Ryde, I.W.
Retoucher, work-up black-and-white (Lady).—W. J., *Photo. News* Office.
Operator, manager.—A. E. Walker, 118, Abbeyfield-rd, Pittsmoor, Sheffield
Operator or manager.—W. D., 2, Nursery-vils, Bounds-grn, New Southgate

Employment Offered.

Fitters, artificial light apparatus.—Luxograph Co., North-end, Croydon.
Learner, for retouch.—N. M., c/o. Shew & Co., Wardour-st., Oxford-st., W.
Operator, first-class, & to retouch.—Hodson, 8, Market-pl., Retford.
Enlarger for general work.—D. S., *Photo. News* Office.
Dry-plate man, first-class.—Dry plate, 37, Thornton-st., Brixton.
Operator and retoucher.—F. Baum, c/o Disderi & Co., 4, Brook-st., W.
Female Assistant Printer.—F. Baum, c/o Disderi & Co., 4, Brook-st., W.
Painter in Oils, Club work.—K., *Photo. News* Office.
Printer & Toner, good Vignetter.—Mr. Vanderweyde, 182, Regent-st., W.
Photo-litho. Oper. (transfers, collotypes,).—Stewart, *Photo. News* Office.
Lady, Youth, and Apprentices.—2, The Pavement, Clapham Common.
Operator, copy, enlarge, &c.—J. Mudd and Son, St. Ann's-sq., Manchester.
Assistant Printer, to reside in house.—W. J. Anckorn, Arbroath, N.B.
You h, to sensitize, mount, &c.—Turner & Killick, 10, Barnsbury-pk., N.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1325.—*January* 25, 1884.

CONTENTS.

A NEW PLAN OF REDUCING THE INTENSITY OF GELATINE NEGATIVES.

MANY methods have been proposed for reducing the intensity of too powerfully developed negatives, which have thus become too dense. Some of these—as, for instance, perchloride of iron and iodine—attack the shadows rather too vigorously, and hence require to be used with much discretion; but still they have found advocates among practical men. Others use chloride of copper (or, what amounts to the same thing, a mixture of sulphate of copper and chloride of sodium). In this process, the copper chloride forms a thin film of chloride of silver, while subchloride of copper is precipitated. Subsequent treatment of the negative with hyposulphite of soda solution dissolves this chloride of silver, and leaves behind a thinner film of silver.

Herr L. Belitzki, of Nordhausen, has recently brought forward another weakening method, which is particularly suitable for negatives developed with ferrous oxalate. It is based upon the observation that the green crystals which are formed in all old oxalate developers, if dissolved in hyposulphite of soda solution, form a ready means of reducing too dense negatives which have not been intensified.

The pure solution of the green double oxalate of iron and potash will not attack silver, and, therefore, even if left for hours in contact with a negative, will not weaken the film.

But a mixture of the double oxalate of iron and potash with hyposulphite of soda does attack silver, the iron salt yielding up its oxygen to the silver, and forming silver oxide, which in a nascent condition is at once dissolved by the hyposulphite.

Herr Belitzki dissolves from 5 to 10 parts of the green double salt in 100 parts of hyposulphite solution freshly prepared (ordinary concentration); but as he prefers to make use first of all of a weak solution, only five per cent. of the green double salt is employed to commence with. The mixture is employed in daylight; it is poured into a dish, and the fixed negative, which need not be washed, is then put in, and taken out from time to time to be examined as a transparency. As the weakening of the negative goes on for a little while after it is put into water and washed, Belitzki recommends that the film be removed from the bath before it is quite thin enough.

The mixture of the green double salt and hyposulphite of soda may be preserved in a dark place most perfectly, and can be used again and again. As soon as a yellow precipitate makes itself seen, the liquid should be filtered, and when it gets too weak, it is strengthened by the addition of a few more crystals of the green salt. That a portion of a negative may be reduced in intensity with the solution is but a matter of course, a pipette or brush being used for the purpose. The stronger mixture, containing ten per cent. of double salt, may be employed for taking stains out of linen, shirt-cuffs, &c.

This observation of Beli zki's at once explains how it is that negatives developed in old and often-used ferrous oxalate solution have usually such thin films. It teaches us, therefore, that all who develop with ferrous oxalate should always employ freshly-prepared solutions; too much density can always be cured afterwards in the way we have just shown.

DIFFUSED LIGHT IN THE DARK-ROOM.

A FORTNIGHT since, we described some experiments undertaken to secure a pleasant and safe light for the developing room, and we showed that an ordinary fish-tail gas-burner at a yard distance could be trusted for the space of two minutes behind a screen of:

1. Four sheets of "stout buff" paper.
2. Three sheets of lumberhand paper.
3. One sheet of thick Harvey Reynolds yellow paper.
4. A sheet of orange glass and a sheet of ground glass.

As daylight varies so much from time to time, there cannot be a doubt as to the advantage of employing artificial light for developing; and certainly one of the best methods of dark-room illumination is to have the flame outside the room, although controlled from the inside. All vapours and gases are thus excluded from the apartment in which the photographer finds himself.

There is no difficulty about adapting the orange and ground glass window to any artificial light, and by making use of an additional orange plate and a second ground glass any ordinary source of illumination may be so tempered as to be perfectly safe within twelve or eighteen inches of a plate.

Still, there cannot be a doubt as to the comfort of daylight as an illuminaut; and as most dark rooms get their light in this way, we have made a few experiments with orange and ground glass to ascertain how these can be safely applied to such apartments. No one is likely to have the full glare of the sun falling upon his dark-room window, so we did not start with these conditions. We took for our experiment a developing room having windows looking into a well-lighted studio, the windows in question measuring 24 inches by 30 inches. These were glazed with a single sheet of orange and ground glass, with the result that the so-called dark-room became almost as light as the studio adjoining.

A plate exposed (covered with a strip of cardboard) for two minutes in this room, one yard from the windows, showed very distinct traces of light.

Half the window was now temporarily blocked up with a deal board, and the other half covered with a second sheet of orange glass. There was now a window measuring 24 inches by 15 inches, of tolerably large dimensions, therefore, which was glazed with two sheets of orange glass, and one sheet of ground glass.

A plate was put into a dark slide, and placed six inches from the window; the slide was pulled up one-third for a quarter of a minute, and at the lapse of this time, pulled up two-thirds for half-a-minute. Afterwards it was developed, one-third of it having been exposed forty-five seconds, and a second third thirty seconds, within six inches of the window: the plate developed clean.

A plate exposed in the room for sixty seconds at a distance of one yard from the window, also developed clean.

There was no doubt, therefore, that the pleasant yellow light afforded in these circumstances was perfectly safe. In case of a casual increase in the light, a curtain of tammy would, doubtless, furnish any further protection that might be necessary.

A further experiment may be mentioned, however, which will show how much more light may be employed with a little judgment. The board blocking up half the casement was taken down, and now, in addition to the former window, there was another equally large (24″ × 15″) glazed with a single orange and ground glass, and admitting therefrom a vastly increased amount of light. A plate was taken out of a dark slide, and a strip of cardboard held against it, at the back of the dark room, at a distance of five feet from the window (where you might have easily seen to read a newspaper), and kept in this way for thirty seconds prior to its development. The experiment, which may be said to resemble the work of a clumsy operator, proved successful, for the plate developed clean. We cannot help thinking, therefore, that for a developing room, ruby light is not actually necessary; if your yellow light is too powerful at any time, temper it by adding another sheet of orange glass, or by employing, as in the old wet process, a curtain of tammy.

THE ELECTRIC SPARK CONSIDERED AS A STANDARD LIGHT.

SECOND ARTICLE.—THE VOSS ELECTRICAL MACHINE.

THE Voss machine differs from the older types of electrical machines inasmuch as its action is not dependent upon friction, but it acts simply by induction, in a manner analogous to the induced and accumulated energy developed in the dynamo-electric machine. In the dynamo there lurks a minute initial charge of magnetism, which sets up a current in the armature when that is revolved, and this current intensifies the magnetic field until its utmost limit is reached. So in the "induction" or "influence" machines of Holtz and Voss, the small initial charge present can by mechanical force be caused to accumulate until the potential reaches the limit of the resistance of the circuit.

The machine we shall now describe has a mahogany polished base-board standing on feet, and at the right-hand side there slides out a bar of wood, carrying a pillar of wood, through which passes a brass tube to serve as the bearing of the spindle of the driving pulley, round which passes the driving cord, whose tension is kept up by sliding out and clamping the slotted bar. At the back of the base-board a strong wood pillar is firmly fixed, and this serves to carry the axle of the revolving plate. There are two glass plates; the larger, A, is 12½ inches diameter, and has a hole 2¾ inches diameter. This plate rests on an ebonite rod let into the back pillar, and upon two small ebonite feet screwed into the base-board. The edges of the glass are nicely smoothed, and on the farthest side there are pasted four discs of tinfoil connected in pairs by a strip of foil, as shown at F F. Over these discs two paper shields, B, are pasted, and each pair is also connected by foil with the elbow-shaped brush-holders, H H.

The moving plate is 10¼ inches diameter, and has a hole in its centre for mounting it on the axis. On the face nearest us there are fixed six discs of tinfoil, D, and on each disc is cemented a metallic button. The two plates, one fixed and the other moving, are mounted about a quarter of an inch apart, and it is this air-space that constitutes the induction field between the discs on the two plates. The moving plate is insulated by ebonite from the axis on which it turns. The collectors E E are fixed on to the end of the axis nearest, and are prolonged to the dischargers C C, which rest upon the two small Leyden jars L L, whose outside coatings are connected by a wire beneath the base-board. The upright set of combs shown in the sketch are more correctly termed neutralizers, and serve to discharge the moving plate of any residual charge not taken up by the collectors before the discs on plate come under the influence of the opposite set of discs on the inducing plate. In practice this neutralizer is placed with its upper part more inclined towards the left, and towards the discs F. The brushes H H are bent so that they just tip the metallic buttons on the face of the revolving plate.

The plates and the jars are carefully coated with thin shellac varnish. The machine described is the smallest size usually made, and is not expensive. A far better insight than any written description can be obtained by procuring one of the machines and taking it asunder and then replacing it, and by studying its form and action much will be learned of its principle which would be difficult to convey in a few pages of the NEWS.

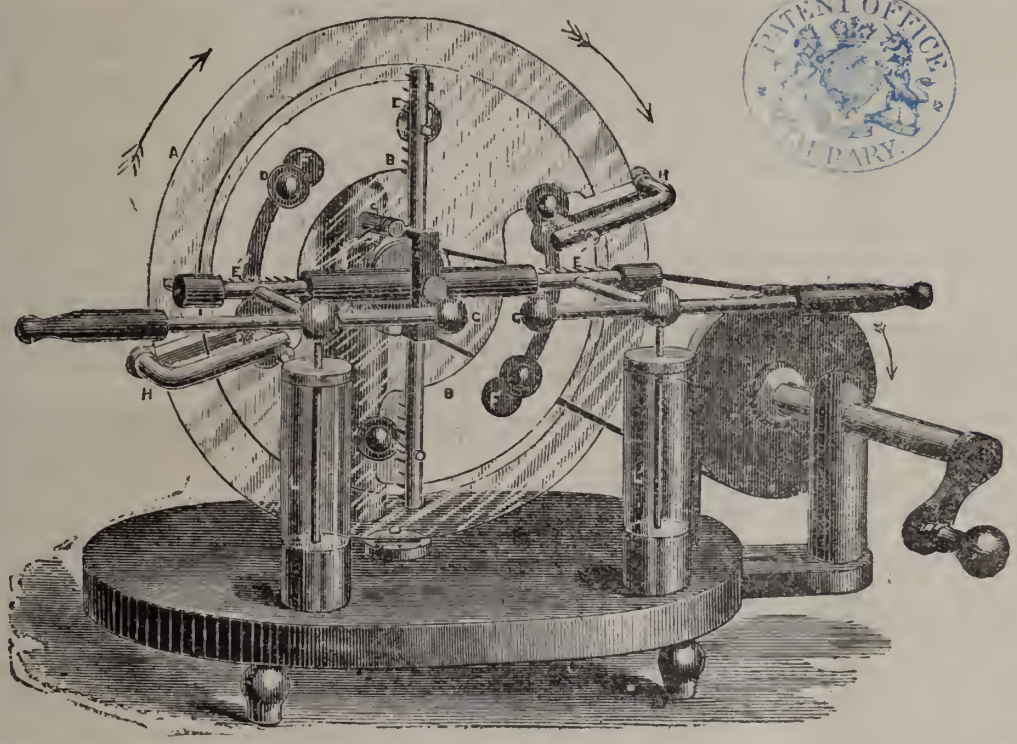
The machine can be used to work vacuum tubes, for which purpose it performs remarkably well—better, we think, than the induction coil. The method of using the machine is as follows:—

A dry and preferably warm room is desirable. In summer the machine will not require so close an observance of this as in winter, when, upon days like last Christmas Day and Boxing Day, the atmosphere everywhere is charged with moisture; this necessitates the warming and drying of the machine, just to dissipate the invisible film of damp which condenses on the glass plates. A film of moisture conducts the electricity away as fast as it is evolved, as may be easily seen by breathing on the plates when the machine is in action; this causes the "current" to cease or reverse its polarity. The machine should be clean—*i.e.*, free from dust—for when a machine is used, so long as it is in an excited condition, it attracts all the dust of the apartment, so much so as to become quite coated over with a black film of dirt, which, of course, interferes with its perfect performance. When cleaning the machine there need be no hesitation in using a damp cloth if afterwards the machine be set near a fire or stove so as to dispel the moisture. As soon as the plates become dry and warm, the machine will perform without any delay; whenever a machine refuses to "take," it may be certain that there is moisture, dirt, or damp somewhere. On dry, frosty days, the machine will usually respond directly, even after standing all night in a cool room, for then no doubt the moisture of the apartment has become condensed upon the windows, especially if the temperature outside is much lower than inside.

The machine being dry and the apartment warm, on turning the handle according to the natural order of things—viz., from left to right in the direction of the hands of a clock—we soon see or hear the machine "take," and the sparks pass between the knobs of the discharger. In a dark-room the whole machine seems alive; it is a beautiful sight to see the violet streams of fire flowing towards the collectors of the discharger, and if we slacken the rate of turning we see the machine "reverse," especially if the distance between the knobs be great, such

as 4½ inches, the maximum length of spark we have been able to obtain with the machine described. If the knobs be drawn beyond one inch apart, the spark is no longer straight, but becomes more or less forked, like lightning, and often the spark traverses a zig-zag path equal to double the distance between the knobs. When the machine is thus strained it would be exceedingly dangerous to interpose the person so as to receive the full force of a discharge of such high tension. A few shocks and smart twinges will soon teach the operator what to touch and what to avoid. Let us now approach the knobs to within one inch of each other, and fix them there so that they will not shake by the jarring of the machine in action; then study the spark at one inch, and observe how very similar each spark is to its precursor.

Now let us remove the two jars which support the right and left halves of the discharger: on revolving the plate, the spark between the knobs is no longer luminous, but appears to be composed of a bundle of thin thready violet-tinted sparks, which convey to the mind the impression that the discharge between the knobs is really a "current," and such we believe it to be. The actinic force of this discharge is extremely low, and proves that the capacity for charge of the machine *per se* may be ignored in our



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calculations of the luminous effects to be employed when the machine is used in its normal state, or under a modified form we shall presently point out.

If we place a piece of plain glass, say a quarter-plate, on each of the brass dics from which the jars were removed, and on each piece of glass place a shilling, and connect the shillings with the arms of the discharger by two straight pieces of brass wire, we thereby make two miniature Leyden-jars, in fact, whose surfaces are not above one-fifth of the jars proper. On turning the handle of the machine, we get sparks decidedly more luminous than when no plates were used.

If we replace the shillings by half-crown pieces, we obtain a marked increase in the brilliancy of the spark. This all proves that it is the storage capacity of the jars which influences the luminosity of our spark.

Let us now take two pieces of rather thin glass, say five inches square, and cut four pieces of tin-foil exactly three inches square, and with paste fix a piece on either side of each pane of glass, leaving an inch of margin round each piece of foil. When dry, clean both sides and give each pane a coat of thin shellac varnish, made by dissolving shellac in ordinary "finish" or spirits. We have now made what are termed "fulminating panes," which are really the coatings of Leyden-jars spread out. It is exceedingly difficult to measure the area of the inside and outside coatings of two small jars, but with our two pieces of thin glass the difficulty vanishes, for we can cut our tinfoils exactly three inches square to a hair's breadth; and here, be it understood, is one of the strongest points of our claim to a standard, for what can be more definite than such data as these?

We will now place our two standard panes on the place usually occupied by the jars, and connect their upper sides with the two brass wires to the discharger. On operating the machine, we obtain sparks closely resembling the jar spark, but we have definitely fixed the unit of surface—viz., three inches square.

The law which operates upon this matter is very clear. The limit of charge of given surfaces depends upon the potential of the machine, and the substance of the dielectric (the glass); but these limits are not strained where the striking distance (the length of spark) is small. For small distances, the striking distance is directly proportional to the quantity of electricity, and inversely proportional to the extent of the coated surfaces; in other words, it is proportional to the electric density. The luminosity, also, is chiefly dependent upon the electric density (limited by the area of the condensers), and is influenced by the nature of the bodies between which the spark passes, the atmosphere, and barometric pressure.

Practically, most of these conditions do not influence the result if we work with a view to uniformity, because, with a machine made to gauge, the atmospheric density is about the only really disturbing element likely to interfere.

For the sake of simplicity and uniformity, therefore, we advocate a standard machine, the plates of which can be made to gauge, the brasswork also to patterns, interchange-

able, and, in fact, the whole affair just like so many bullets cast from one mould; the chief care being devoted to the specific inductive capacity of the condensers, and the coated area. Brass may be safely relied upon as a pretty constant article for the metal parts of the machine, and such matters as residual charge and atmospheric pressure may be disregarded. The rest are merely matters of detail.

The data now given will bear examination from a practical, as well as a theoretical, point of view. In the use of the phosphorescent tablet, vast errors may arise in exciting the tablet, but still more seriously in fixing the period between the end of excitation (the period during which the most rapid decline occurs in the luminous surface), and the commencement of the luminous action upon the sensitive plate behind the screen. Further, the distance between the luminous tablet and the screen is about half-an-inch, therefore the thickness of a piece of paper is sufficient to mar the results. In our electric spark system time is not an element: it matters not whether the one hundred sparks be drawn as quickly as the mind can count them, or whether they pass at the rate of one per minute; and can it be supposed that a trifling error at six inches difference between light and screen can weigh with one-hundredth of the force it would do if only separated by half-an-inch? Time being left out of the calculation, if we count one spark too many or one short, it merely makes a difference of one per cent., a quantity totally inappreciable. The hundredth spark will have the same actinism as the first: there is no "decline."

Another careful point to be studied would be the one inch of separation of the knobs of the discharger. We shall eliminate any error here by either making the balls a fixture, or else making the printing-frame and discharger all in one piece, with knobs set inalterably at a fixed inch.

Phosphorescent sulphide of calcium is made which absorbs, and therefore, gives off all the different colours of the rainbow. How, then, can it be pretended that constancy can be claimed for an article of which one tablet may be made giving off a violet, and another a tinge of red? Admit, for the sake of argument, that a luminous tablet is a standard within itself, in relation to itself; that would depend upon the excitant, and the duration of excitation; and maybe a farthing candle would be equally entitled to be considered a standard. Then, again, temperature has a marked effect upon the return of light from a phosphorescent tablet. For instance, if we excite a tablet, and a finger or thumb comes in contact with its back, probably just by the time an exposure is being made the heat of the digit will have penetrated sufficiently to cause that part to give off an increase of light capable of forcing out an additional number or two. No such errors as these are possible by the proper employment of the electric spark system.

It would be quite possible to ensure constancy in the air through which the spark passes by enclosing the knobs in a glass vessel containing pure dry air sealed from the outside atmosphere; but we really do not think this is necessary. If the air of the apartment is such that the machine will perform properly, we believe the spark will be found remarkably constant.

We would suggest that the standard machine should be set under an air-tight glass case, on a stand *à la* sewing machine, and driven by a geared pinion through the base. A tray of chloride of calcium would keep the air dry, as would be indicated by a strip of carbon tissue and a chloride of cobalt test paper suspended within the case. The balls of the discharger could come out through two holes in the glass bushed by ebonite washers. If manufactured in numbers, the capacity of the jars for charge could be measured, and all made electrically equal; in other words, any number of machines could be turned out giving sparks of the *same actinic force*.

This, then, is our Standard Electric Light.

By-the-Bye.

SOMETHING PRACTICAL ABOUT LENSES.

FAR be it from us to decry the theoretical study of optics, especially as applied to the photographic lens. On the contrary, until the photographer has got into his head some idea of the construction of lenses and the laws that govern their focus, he is likely to blunder about every time he ventures upon the simplest of optical problems, and, what is worse still, do inferior work, by reason of ignorance of the tools he possesses.

But there is no use in acquiring knowledge which fails to stick in one's memory. The school-boy is pat at his dates while at school, and can tell you quickly the year Edward the Black Prince died, or the day that King Henry VIII. proclaimed himself Defender of the Faith. Unfortunately, unless he gets something more than the mere theoretical date by heart—unless he takes, for instance, an interest in some fact or event in connection with that date—this gradually fades away like a latent image that is never developed, and his mind is once more a blank. So it will happen to the photographer who only takes optics theoretically, and never experiments practically with his lenses; and our object at the present moment is, while leaving theory to take care of itself, as it is quite capable of doing, to demonstrate how a few hours of the dull weather may be profitably spent in learning something practical about one's lenses.

Some photographers are in possession of a whole battery of lenses; others manage to do a vast amount of work with three or four. Now, for the sake of argument, we will suppose our photographer has half-a-dozen. They are of various kinds and have different names; but beyond knowing that he usually employs this one for carte pictures, that for out-door work, a third for copying, &c., he knows little definitely about them, and his assistant probably less.

Now a straightforward way of comparing the capacities of lenses in a practical fashion, is to adopt some common object, say a two-foot rule, and to look at this on the focussing glass of your camera at a medium distance, say twelve feet from the lens. You have then always a measure of the capacity of a lens in your eye. My No. 1 lens, you will say to yourself, makes the two-foot rule, at a distance of twelve feet, appear exactly 5½ inches long, while my No. 3 lens shows an image of 3⅜ inches, and my No. 7 gives an image of but 1 inch. To make matters quite clear, you try all your lenses, and note the results on a card, thus:

COMPARISON OF LENSES.

Size of a two-foot object at 12 feet.

No. 1.—Copying lens (focal length 26½ inches)	...	5½ inches
No 2.—View lens (focal length 20½ inches) ...	...	4 "
No. 3.—Portrait lens (focal length 17¾ inches)	...	3⅜ "
No. 4.—Portrait lens (focal length 12 inches)	...	2 3/16 "
No. 5.—Wide angle, view (focal length 7 inches)	...	1 5/16 inch
No. 6.—Portrait lens (focal length 6 inches)...	...	1 1/16 "
No. 7.—View (focal length 6 inches)... ...	...	1 "

Two or three copies of this card are made and put up in the studio, work-room, and elsewhere, where it is in view of everyone in the establishment. In this way, a practical acquaintance with the lenses is soon made, and when some picture has to be taken beyond, say, the ordinary carte portrait, the photographer, whether he is principal or assistant, has in his mind what lens is most likely to fulfil the conditions required. He has but two factors to bear in mind—the two-foot rule and the distance of twelve-feet—and he can at once give a good guess which of his lenses to screw into the camera forthwith.

Of course, there are the peculiarities of the portrait lens and the landscape lens to be taken into consideration; but the distinctions here are not so marked as they used to be before the days of gelatine. The out-door photographer,

who has many lenses, employs that which embraces the view he wants, and is of longest focus, that is to say, if he desires the largest picture he can get. But sometimes space is limited for the camera—he cannot get back far enough—and then he must needs employ his short-focus instrument, and put up with abnormal effects in the foreground. At the same time it is well to bear in mind that the rule to employ as long a focus lens as possible has exceptions, and a very important one came under our notice the other day. A technical dispute arose as to the abrasion of a metal surface; it was so slight that to the uneducated eye the abrasion could not be distinguished from ordinary tool markings, and a photograph taken with a long-focus lens, to get the image as big as possible, scarcely assisted the disputants. But when a short-focus lens was employed, the sweep of the abrasion was concentrated, and a smaller but much more sharply-defined image of the defect was at once produced.

A practical experiment touching the focus of lenses will also impress upon the mind of the photographer a fact otherwise not sufficiently appreciated. If a map or plan has to be reproduced, to take an example, the photographer, naturally enough, takes out his copying lens to do the work. He stretches the map upon a flat drawing-board, gets his camera level, and focuses. Now he is usually enjoined not to focus the lens on the very centre of the map, nor on the outermost margin, but at a spot midway between these; in other words, if the map has a diameter of four feet, he is to focus one foot from the central point. This is the advice, we say, generally given in handbooks and manuals. Now a simple experiment will demonstrate the falsity of this, and he will ever after bear in mind the lesson taught him.

Let him take his No. 1 lens with its 26½ focus, and at a distance of, say, twelve feet, set up a dozen slips of card, each of them half-an-inch apart. A deal board with cross cuts half sawn through, will do to stick the cards in one behind the other, each succeeding card being a little higher, so that all are seen from the front. The cards are one and all marked with a fine cross in Indian ink and a consecutive number, the card nearest the lens bearing the figure 1. The focus is accurately adjusted, we will say, on No. 6, and a picture is taken. What is the result? Why, what any photographer with a moment's thought would have foreseen. The cards 5 and 4 are tolerably in focus, to judge by the Indian ink crosses, but 3, 2, and 1 are altogether blurred; on the other hand, not only are 7 and 8 in tolerable focus, but so are 9 and 10. In short, at this distance—12 feet—our copying lens may be said to blur an inch in front of the focus and about two inches behind the focus, the intervals varying, of course, with the distance of the lens from the object.

Now there is nothing new in this. Everyone, as we have said, who has considered the subject, would say the result was exactly what he had expected. And yet the general advice given in copying a map or plan has always been to focus half-way between centre and margin; in other words, to throw half the object in front of the focus and half of it beyond. This, under any circumstances, cannot be right, and the photographer who once will practically make the experiment we have suggested will never fall into the error. He will know that one-third before and two-thirds beyond the focus is generally much nearer the mark; and having learnt this lesson, he will find it to be a valuable one almost every day of his life.

In what way one lens varies from another lens may be made evident to the meanest capacity by simply photographing a diagram through a transparent scale. This transparent scale may be produced upon a glass plate covered with matt varnish, or a film of albumen, and consists of a series of true squares and true circles one inside the other, &c. The scale is produced either by means of a pencil and ordinary drawing instruments, or by transferring from lithographic paper to the glass by the aid of transfer ink. This scale is put into a dark slide and used as a focussing glass, in the first instance, the object to be photographed being a large diagram similarly marked with a series of true circles and true squares, only larger, easily produced by any one in the possession of a set of drawing instruments. One of the squares or circles of the diagram is made to coincide—as well as may be—with one upon the scale, and then a sensitive film is adjusted immediately behind the transparaut scale, and a photograph taken. The resulting image will be naturally "out ofdrawing"; that is to say, the square photographed through the lens will not tally with the square photographed by contact. The latter image will be true, the former more or less distorted, and any one wishing to test two lenses for distortion, has here set before him a plain unvarnished story that cannot fail to be appreciated. If he wishes to know in what way a portrait lens differs from a view lens, or how far he can trust his wide-angle instrument, he has but to secure a photograph of his standard diagram through his standard scale to find out. It is well for the photographer to keep by him a scale result from each lens—taken at a given distance—which will aid as much as the other card we have mentioned in keeping him acquainted with the capacities of his lenses; while the fact of his having made a practical experiment is more likely to fix the knowledge in his mind than all the reading in the world.

The "By-the-Bye" next week will be "Studio Dressing Rooms."

Review.

A DIGEST OF PATENT LAW, and Cases Incorporating the Provisions of the Patents for Invention Act, 1883. By H. A. GRIDLEY, M.A., Barrister at Law. (*Marcus Ward and Co.*).

SO-CALLED manuals of patent law issued by patent agents exist in abundance; but as these are ordinarily written with a view of bringing clients to the agencies issuing them, it is not desirable that too much reliance should be placed upon them. The hand-book of patent law now before us is, however, a work of a very different character, as it is an exhaustive treatise written mainly for the use of the legal profession; but the language used is so clear and free from unnecessary technicalities, that it is difficult to suppose that any person should misunderstand it.

The concise abstracts of leading cases are of especial value, as in legal matters it is quite as important to consider the interpretation which judges put upon the law as it is to study the law itself.

THE SPECTROSCOPE AND ITS RELATION TO PHOTOGRAPHY.

BY C. RAYS WOODS.

No. 1.—INTRODUCTORY.

IN the early part of the present century, when Wedgwood, Niépce, and others were making some of the earliest attempts at producing pictures by the aid of the sun, a new method of investigating* the nature and properties of light was brought about by the use of a triangular glass prism combined with a narrow slit. Spectroscopy and photography may almost be regarded as twin sciences, for though the former was the first to assume a really practical shape, the births of the two sciences were contemporaneous, and from that time to the present many of those experimenters who have given their attention to the one have been equally ardent disciples of the other. Both studies have been mutually dependent on

* The writer's attention was drawn to this experiment by Professor C. H. Hastings, Ph.D., of John Hopkins University, Baltimore, U.S. As to whether it originates with him, I am unable to say.

one another, and it would be exceedingly difficult to say which is the greater debtor; if photography has had to go to the spectroscope for explanations and revelations concerning many of its obscure points, the spectroscope is, in its turn, no less indebted to photography for its recording power, so much more trustworthy than human vision. Either science might have progressed independently of the other, but, happily, such misfortune was rendered impossible by the facility with which men, almost intuitively, perceived the relationship.

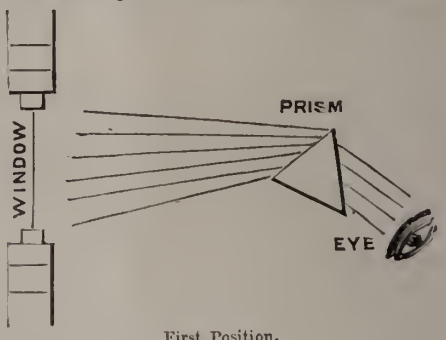
This partial independence of two branches of science, both dependent on one common phenomenon—light—is, unfortunately, however, the reason why some at least of the votaries of the one pay but little attention to the other. Photographers, it must be admitted, are the worst sinners in this respect, nor can it be wondered at, considering that their science has assumed a commercial aspect, and has thus become an art. The wonder is, after all, that so many photographers follow with interest the accounts continually being published about spectroscopic work. And yet, except when these accounts are chiefly intended for photographers, and occasionally even then, they are necessarily somewhat technical, and correspondingly difficult to be understood by those who do not make spectroscopy a special study.

That a large number of workers do not interest themselves in such matters is, under the circumstances, scarcely a matter for surprise. It is for this class that the writer proposes to give a short series of articles on the "Spectroscope and its Relation to Photography," as the reader will see by the title at the head of this column. Whilst endeavouring to make the subject clear, it is proposed neither to write a comprehensive treatise for those already interested in the subject, nor yet an excessively elementary account for that much-catered-for entity, "the meanest understanding,"

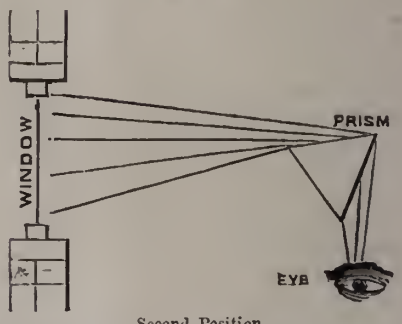
The individual of fairy legend and folk-lore, who went to sleep for a hundred years or so, seems to have a counterpart in the annals of science. The "sleeping beauty," which, under the hand of Newton, bid fair to arise and astonish and attract the world, was scarcely even unveiled till the touch of Wollaston roused the dormant power, and brought it into a world of life. Why Newton failed to discover the spectroscope the reader knows; he used at first a round hole, and then a wide instead of a narrow slit, and for a century and a quarter the man of science went on repeating the experiment, and the artist glibly talked about the primary colours, without getting one step further. Newton's simple experiments can be readily repeated with even a common chandelier prism. A ray of white light from a hole in the shutter of a darkened room is allowed to pass through a prism, and fall upon a screen. It is then seen to be split up into seven different colours. A spectrum thus formed is, however, a very impure one, for the different colours overlap one another.

When Wollaston substituted a fine slit for the circular aperture, he not only got a purer set of colours and better gradation of tint, but he found that the spectrum was crossed by a number of fine black lines. Only twelve years elapsed before 576 of these lines were mapped out by Fraunhofer, in honour of whom they are called Fraunhoferic lines. These lines may be seen with the very crudest piece of apparatus; the rough prism used for ornamental purposes referred to above will show them, although the glass is not so dense and so uniform, nor the surfaces as well polished, as in the prisms used for spectroscopic purposes.

Draw down the window blind till the light only comes through a narrow chink. Take a triangular prism, with two sides at an angle of about 60° if handy; go to the end of the room opposite the window, and look through the prism, holding it in a horizontal position. Some of the darker lines of the solar spectrum may then be seen. Another way of seeing these lines, and one which may be new even to many of those familiar with the subject, is to use, not a narrow chink, but a hole of any shape, or even the whole aperture of the window. Standing at the further end of the room, and holding the prism vertically, get the eye and the prism into such a position that the whole of the window is seen. It will appear white along its main breadth, with the edges of the framework fringed with colour. Now turn the prism round till one edge is nearly at right angles to the window, slightly shifting the position of the eye at the same time. As the position of the prism is altered, the window will appear gradually to contract till its opposite edges meet, when the dark lines will appear—the accompanying diagram showing the two positions; the diagram is made in plan—that is, looking down from above



First Position.



Second Position.

As mentioned, a prism of ordinary glass is quite sufficient for the purpose; in fact, with very dense glass, the effect is not so readily obtained. If the observer, instead of using an aperture such as a window or doorway, looks at the sun in this manner, he will be able to see a very large number of lines, and this, remember, without the aid of a slit. The reader would not thank us for the mathematical explanation of this, but will doubtless be able to see that what takes place is, practically speaking, of the nature of foreshortening.

But to return: Fraunhofer, in A.D. 1814, mapped 576 lines of the solar spectrum, his apparatus consisting only of a slit and a prism. A further addition was made by a famous optician, Mr. Simms, who added what is known as the collimator and telescope. The first consists of a lens placed in front of the telescope, and so arranged that the slit is in its focus. The utility of this will be at once apparent, for all light passing through the slit and falling upon the lens is rendered parallel, and is thus utilized, instead of the small amount of parallel rays that pass through a fine slit. The object of the telescope is to collect these rays and pass them all through the small aperture of the pupil of the eye. The principle of the telescope here is the same as in viewing a distant object—a landscape or a celestial sphere. The object-glass of the telescope brings the rays to a focus, and forms an image of the spectrum. This image the spectrum photographer receives upon his plate; the observer adds the eyepiece of the telescope and magnifies it. This is still

the usual form of spectroscope, and in our next article we purpose showing in detail the construction of such an instrument suited to the requirements of a photographer, and the adjustments necessary in order to obtain the best results that the apparatus will give.

FRENCH CORRESPONDENCE.

PHOTOGRAPH OF THE SOLAR CORONA—SHAPE OF A POCKET-CAMERA—THE LENS FOR SAME—CONSTRUCTION OF THE DARK SLIDES—BITUMEN OF JUDEA.

M. Janssen's Photograph of the Solar Corona.—The annual number of the *Bureau des Longitudes for* 1884 contains a photograph of the sun's corona during the total eclipse of May 6th, 1883, taken by M. Janssen, of the Institute of France. The picture has been neither retouched nor enlarged. It was taken in an instrument mounted in the direction of the parallax, with a lens eight inches in diameter, and 1·20 metre focal length. The exposure lasted during the whole of the eclipse, about five minutes. M. Janssen says that his photograph shows a more extended corona than was visible in the telescope. The photometric measure of the intensity of the corona's luminosity at Caroline Island was greater than the illumination from the full moon. This shows the importance of photography in astronomical observations.

The Shape of a Pocket-Camera.—As is always the case in foggy weather, at this moment there is very little doing in photographic matters. It is therefore fitting to discuss in a few words the interesting subject of pocket-photography. Up to now I have never met with a so-called "pocket-camera" really fulfilling its name with regard to absolute portability and power of taking a number of prints. Most of them have been constructed for use with glass plates, a very serious drawback to both essential qualities. The first thing is, what shape is more suitable for this desideratum—the opera-glass or revolver? The answer must be a negative one. The opera-glass form has the objection of allowing such a small space to be utilized. The square inscribed within the circumference of the glass is, as the annexed diagram shows, very much

Fig. 1.

smaller than the circle, so that with the thickness of the grooves, glasses, &c., the whole space at command is scarcely half the area of the circumference. It is necessary at all times to get a result large enough to be clearly legible without resorting to enlarging. The same objection is to be met with in Enjalbert's photo-revolver—negatives 4 centimetres square, however sharp,

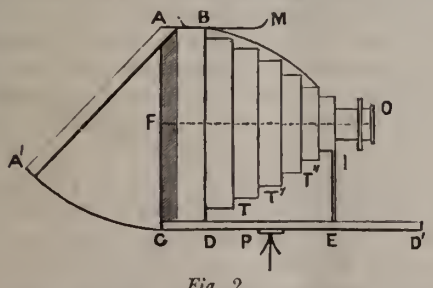


Fig. 2.

are not large enough. This disadvantage obliges me to reject both forms, and I greatly regret that the opera-glass form cannot be employed, as anyone using it would not excite suspicion. A monocular form of field-glass might be adopted, perhaps, allowing of a slightly larger negative to be taken, but one would have to look through the large end, the lens being at the smaller end. I have therefore abandoned all idea of simulating a field-glass or firearms, and have returned to a rectangular shape. By referring to diagram (fig. 2) the construction of my pocket camera will be seen. T T′ T″ represent the drawers, similar to those of a telescope, the space A C encloses a dark-slide shut in by the back A A′. The base D D′ is firmly hinged on to C D, and at E a little upright support, E I, allows of the exact focal distance O F being preserved. Negatives of 6 by 6 centimetres may be taken in this camera measuring 95 by 75 by 15 millimetres. The dimensions of the light double dark-slides are 90 by 65 by 2½ millimetres, six of which may be easily enclosed in a box, two such boxes containing twenty-four sensitive pellicles.

Lens to be Used with Pocket Camera.—I prefer to use an aplanatic lens for groups, views, monuments of 8 to 10 c.m. focal length, and exposed in the place of the diaphram by a rapid drop-shutter acting by a litttle bolt or trigger. The lens and shutter should be carried separately, and fixed on the camera when required for use. Along A B is a rule, so that the object aimed at may be properly centred, while the ledge A M has a screw at each entremity, so that the two knobs are in a line with the object when exposing.

Construction of the Dark Slides.—With regard to the dark slides, they are constructed of pasteboard ½ m.m. thick, the slide bearing on each side a pellicle 6 by 6 c. m. adhering to the surface by means of diachylon (as previously described in my last letter). The base of the actual slide is held down by the back lid while the enclosing case can come out at an opening at the side up to a certain length; when it is stopped, all light is prevented from entering by two springs covered with black velvet tightly clasping the exterior of the slide. Boxes containing the slides in sixes, have sliding openings at the top and bottom, to ensure the same plates not being exposed twice over; they should be put in at the top and taken out at the bottom for use, the words "in" and "out" being written on the respective lids (see fig. 3).

Fig. 3.

This whole apparatus may be really used with precision, not treated as a plaything. It is completed by the addition of a walking-stick. The camera may be carried in a leather case, to keep out dust, &c.

Bitumen of Judea.—Many who use bitumen of Judea for impressions on zinc are not aware that its properties may be considerably increased by the addition of a small quantity of coal-tar; I have used it with success in solutions of the bitumen in benzine. LEON VIDAL.

Notes.

A Arte Photographica is the title of a new monthly magazine published in Oporto, in the Portuguese language. M. Carlos Relvas and Mlle. Relvas, two distinguished amateurs, are on the editorial staff.

The annual meeting of the Photographers' Benevolent Association will be held on the 30th inst.; the Society has, so we hear, increased its balance at the bankers during the past year.

We are glad to hear there is a prospect of Professor

Donkin becoming the honorary secretary of the Photographic Society; no better choice could be made.

Our proposal to use orange and ground glass in the dark-room, so as to ensure a minimum of actinic and a maximum of visual light, is finding favour on many sides; on another column we print a letter from an able amateur—Mr. Blake, late M.P. for Leominster—who seems to have had little difficulty in adapting the combination to a daylight window.

Mr. Francis Galton, F.R.S., whose name, at any rate in connection with composite portraits, is known to most photographers, has recently published two works in connection with family records. The first, namely, "Record of Family Faculties," is little more than a collection of blank forms, in which the owner is to fill in data about his great grandfather and mother, &c., &c., and, in fact, give the most exact records he can about his family, and Mr. Galton will give prizes to the value of £500 for the best writing up of these records. The other book is the "Life History Album," which the owner is also to keep up and illustrate with photographic portraits of himself.

The "Life History Album" will represent a man's or woman's life from birth to death. It is divided into periods of five years, up to 75 years of age. The first periods will be filled up by parents, and only when you have arrived at years of discretion are you to write in details about health, occupation, diet, habits, &c. Every five years you are to be photographed and a portrait pasted in the book, so that when you have passed the three-score years and ten, there will be before you a little picture gallery showing how you have reached the meridian of life and gradually but surely declined afterwards. The volume will hardly be lively reading to its owner, and we are quite sure the illustrations will not raise his spirits, for over and again he will be looking at the last page and wondering when it will be filled. A man feels little interest in his decline and fall off, and less still will be felt when he is dead and gone.

Baron Karl von Jagemann, one of the court photographers to the Emperor of Austria, has died at Vienna. He received from the State the large gold medal of science and art.

Does the first-class professional photographer abroad occupy a higher position than his brother in this country? We think so. For instance, there is no photographer with us equal in rank to the late Herr Karl von Jagemann, of Vienna; and the same may be said of M. Levitsky, in the gay capital of St. Petersburg, who is an undoubted member of the aristocracy. In Paris, in the days of the empire at any rate, several of the best photographers moved in high circles; and the same may be said of the most distinguished men in Stuttgart and Dresden. Indeed, as we go further afield, the rank of the photographer seems to increase, for there is a Persian Prince who practises photography, and the brother of the Mikado of Japan is also said to be in the profession.

M. de Maupas is publishing the history of the Coup d'Etat in 1851, which he, as Prefect of Police in Paris, was instrumental in carrying out. The barricades and their defence in Paris, at that time, were never quite believed in, and some say that Napoleon had a hand both in setting them up and breaking them down. In those days photography was not sufficiently advanced to take note of these things, or M. de Maupas might have illustrated his book; though, possibly, such records would not have been welcome, after all, for camera pictures have a way of interfering very seriously with the romance of a story.

The barricades of the Communists in 1871 were not only photographed, but were depicted while in course of construction. We are in possession of a series of these pictures, one of the most interesting being a photograph showing the barricade stretching across the Rue de la Paix, above which is seen the pedestal of the Vendôme column, for the column itself is not there. It was these photographs that afterwards gave the most damaging evidence against certain Communists, who could not deny their portraits when they were shown themselves superintending the work of obstructing the streets. Perhaps, if similar photographs were in existence of the making of the 1851 barricades, M. de Maupas would not find his writing go quite so smoothly.

With reference to incandescent lighting, we said (p. 386 of our volume for 1882):—"If it could be made practicable to work incandescent lamps at a high temperature, as in the case of our experiments, the cost of incandescent lighting would immediately fall to about one-fortieth that of gas, as the high incandescence does not require a correspondingly increased consumption of electrical energy." Professor Adams, in speaking at the Society of Telegraphic Engineers the other day, pointed out the same thing; but he did not say that we were the first to call attention to the fact.

A photographic partnership was the cause last week of a singular instance of disagreement between judge and jury. The case was heard at the Sussex assizes, the plaintiff, Mr. Wing, a photographer of Tunbridge Wells, suing the defendant, Mr. H. Barmach, to recover £50 as damages for non-fulfilment of a partnership agreement. The plaintiff's case was that he negotiated with defendant for some time, but ultimately it was arranged defendant should purchase a half share of the business for £500. The deed was drawn up, but at the last moment the defendant refused to conclude the contract, alleging that he had not received sufficient evidence of the stability of the concern. The defendant, on the other hand, gave evidence that he refused to sign the agreement until the stability of the business had been proved to his satisfaction, and the plaintiff had refused to go into the matter until he had become a partner. It was also contended plaintiff had really put an end to the agreement by writing

that if the agreement was not signed by a certain date, he should not accept him as a partner. The jury found a verdict for the plaintiff for the full amount; but the judge was of opinion that the verdict should be for the defendant, and ordered judgment accordingly.

Travelling photographers should read Mr. B. H. Buxton's letter in another column. During a journey to America, in re-packing his exposed plates, he "laid the first plate film downwards on the packing paper, and the other plates film downwards upon each other with nothing between them." The plate next the packing paper, it appears, got scratched sometimes, but the others were none the worse. However, Mr. Buxton's travelling experience—and it is not small—seems to show that the best mode of packing plates is film to film with a thin sheet of blotting-paper between.

Some of the Berlin photographers complain that after sensitizing albumenized paper, the silver solution sometimes runs off in rivulets, as if the surface of the paper were greasy, and in this way wave-like streaks are produced. A remedy for the defect, according to Herr Roloff, is to blot off, immediately after sensitizing, with bibulous paper, a plan, as everybody knows, frequently adopted in this country.

Since photographers are as seriously injured by piracies as painters and engravers, we may well be believed when we say that we heartily sympathize with the recent complaints in the *Times* against the wholesale traffic in unauthorised photographic reproductions. But we do not think, with the Fine Art Society, that if the pictures of our Royal Academy were photographed and sold in open market immediately after the Academy opened, that "the value of artistic copyrights would tumble from hundreds to tens of pounds in a day."

On the contrary, we are convinced that if a few artists with big names suffered from such a course, the great majority of painters would be considerably benefited. Where one engraving of a painting is now sold for a few guineas, hundreds of photographs would be disposed of for, say, five or ten shillings a-piece—supposing the photographs were thoroughly well executed and of handsome dimensions. In Paris the plan has been in operation for some years, and large numbers of the favourite pictures in the year's *Salon*, whether these are by known or unknown artists, are sold. That such a state of things may be to the detriment of engravers and to the publishers of engravings, like the Fine Art Company, unless the latter march with the times, is exceedingly likely, but it is a change that must come sooner or later, especially as both France and Germany are well on the way towards it.

We even doubt whether the great artists would suffer by the wider publication of their works by the aid of some photographic process. But the advantage, as we have said, would be with the rising artists, who would thus get "published" to the world forthwith, and realise something for the copyright of their paintings. In a word, a rising painter, no matter how young or obscure, if he produced an attractive picture, would have equal chances with the élite of his profession, of reaching the public eye.

The *Pall Mall Gazette* evidently does not study the PHOTOGRAPHIC NEWS as it should. Last week appeared an article a column in length detailing the woes consequent upon paterfamilias announcing in the *Times* an increase to his family. Among other troubles, he refers to the pertinacious offers of photographers who photograph the printed announcement, and send him a copy begging for sixpence in return. Paterfamilias says he is the first who has called attention to the grievance, but in this he is wrong, for a correspondent did the thing before him in our "Notes" of June 22nd last year.

Photographic apparatus forms a part of the very complete balloon equipment which has just been despatched by the French Government for China.

Photography is not exempt from the law of political economy. When the retouching of negatives was first introduced, the demand for skilled retouchers was far in excess of the supply, and high rates of payment could be obtained. That happy time is passed, and the supply of retouchers now exceeds the demand. Wages for this class of work are, we are informed, about one-third less than they were three or four years ago.

It seems more than likely that photography will be pressed into the service to measure electric light. More than two years ago, it may be remembered, we published some tests made to ascertain the light given by various Swan lamps in this way, and the results were exceedingly promising. The photographic record would always be useful in confirming the ordinary photometric test, for electric lights are frequently difficult to estimate correctly.

Patent Intelligence.

Applications for Provisional Protection.

1497. DAVID HOYLES CUSSONS, 79, Bold Street, Liverpool, photographic chemist, and WILLIAM TULLIFFE TURNER, 79, Bold Street, Liverpool, apparatus manufacturer, for an invention for "Increasing the focal length or range of an ordinary photographic camera by means of a collapsible extension front."—Dated 16th January, 1884.

1622. ALEXANDER CRAWFORD LAMB, of Reform Street, Dundee, in the county of Forfar, hotel proprietor, for an invention for "Improvements in photographic cameras."—Dated 17th January, 1884.

1794. ROBERT BOLES GARDE, engineer student, Training School for Engineer Students, Devonport, Devon, for an invention for "The improvement of photographic shutters."—Dated 21st January, 1884.

1814. FREDERIC WILLIAM HART, of 8 and 9, Kingsland Green, London, in the county of Middlesex, manufacturer of scientific instruments, for an invention for "Portable folding tripod stands; improvements therein."—Dated 21st January, 1884.

Notice to Proceed.

4471. RICHARD BROWN, and ROBERT WILLIAM BARNES, and JOSEPH BELL, all of Liverpool, in the county of Lancaster, for an invention of "Improvements in means for, and method of producing designs upon paper or other fibrous or soft material." Dated 19th September, 1883.

Specification Published during the Week.

2677. ALEXANDER MELVILLE CLARK, of the firm of A. M. and W. Clark, of 53, Chancery Lane, in the county of Middlesex, Fellow of the Institute of Patent Agents, for "Improvements in, and in apparatus for, changing and storing photographers' backgrounds and other movable scenery." Communicated to him from abroad by William Evans Lindop, of St. Thomas, in the province of Ontario and dominion of Canada.

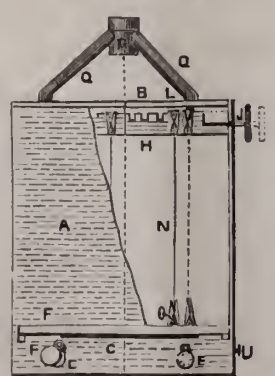
This inventiou consists of a gate or switch-like frame provided with rails at top and bottom, together with a series of stalls, each having rails at corresponding heights to those of the gate to receive a background, the gate or switch being so pivoted that it may be brought opposite to any one of these stalls so that the background therein may be readily run on to the gate for use from any one of the stalls, and *vice versa*. The backgrounds have rollers at back, which run on the rails of the gate and sustain the background in position, and the gate is pivoted or hinged to any suitable support at one end or at some intermediate point, and its hinge rod made double-jointed or cranked in order to enable the gate to be shifted about for altering the position of the background. The stile of the swinging end of the gate is provided with one or more spring catches to engage with the posts of the stalls to hold the gate while changing the background. A spring holds the other end of the gate at the same time, said spriug beiug attached to the floor to receive the bottom part or crank of the hinge rod, and fastened at oue end only, in order that the other eud may slide along the floor and be depressed by the crank which passes into a notch in the spring, whereby the hinge rod is held in the required line with the stall. Where space will allow of it the stalls will be extended in a straight line, and backgrounds of said construction employed; but to provide for storiug the backgrounds in less space they may be made flexible by means of narrow strips or slats properly jointed together, the stalls being curved so as to turn corners or run in circles, or nearly so if desired. The rollers on the backgrounds are grooved for running on the rails; but grooved rails may be employed with rollers to ruu in them if desired, and other modifications of the details may be made. The gate is provided with a castor wheel on its free end to preveut it from sagging, and by preference the lower guide-rolls on the backgrounds (when used) will be located under the lower rails of the gate to have better effect in bending the flexible backgrouuds to the rails.

Patents Granted in America.

291,544. IRVING B. SNELL, Philadelphia, Pa., "Process of colouring photographs."—Filed July 12, 1883. (Specimens.)

This *invention* consists in the use of "Diamond package dyes" in conjunction with gum and sugar.

291,722. BENJAMIN F. HALE, Rochester, N.Y., "Apparatus for drying photographic paper."—Filed May 9, 1883. (No model).



Claim.—1. The herein-described apparatus for drying photographic paper, consisting of the box A, provided with suitable air inlet and outlet passages, the reciprocating frame I, bars K, having paper-clips L L, and one or more heating devices, T T, substantially as and for the purposes set forth.

2. The combination, with the box A, provided with suitable air inlet and outlet passages, of the reciprocating frame I, adapted to support the paper during the drying operation, the removable screen G, and a suitable heating device, T, substantially as and for the purposes set forth.

PRINTING.

BY W. M. ASHMAN.*

FUMING, for some reason or other, is not looked upon with much favour in this country, but why, I cannot say. My experience commenced in this city fully twenty years ago, and I have continually practised it both here and in America since that time. It has been said that the climate of America is of such a nature that fuming is necessary, but here there is no advantage gained. This is simply nonsense; America is far too large a country to be placed in the catagory of auy particular climate. She possesses climates of all sorts, and as my experieucc of fuming extends over some thousands of miles, I hold that fuming is desirable in auy climate.

When hydrate of ammonia is exposed to the atmosphere, pungent fumes of the gas are given off. If these fumes be collected in a closed box, and sensitized paper is placed therein, the sensitiveness is considerably increased—in fact, nearly doubled—and the colour of the print becomes purple, or blue, according to the energy of the gas, and the duration of its action. Among other advantages, fuming permits less concentrated silver solutions to be employed in sensitizing. Less time is occupied in printing, also toning, meaning economy in time and material, and mealiness is uever seen. It is for this latter reason that pictures printed ou fumed paper give such better results in copying than those pictures which are printed on unfumed paper. I strongly advotate the adoption of ammonia fuming by all those engaged in printing from gelatine dry plates, being convinced that it only requires a fair trial to render its use general. Purchase liq. ammonia fortis s.g. ·880, in capsuled bottles or Winchester quarts. The present price is not more than sixpence per pound. Use a measured quantity, say 2 ounces, in a saucer placed at the bottom of an air-tight box; lay the sheet to be fumed on netting stretched an inch or two below the lid; the distance between the liquid and the surface of the paper should be fifteeu inches at least. To ascertain the proper time to fume any given sample of paper—for the different makes vary enormously—it is better to start by exposing the paper in the box for one miuute; cut off a corner and expose it to daylight. If the colour is red as it darkens in the light, the action has been insufficient, and it will be quite safe to return the paper for at least another miuute; at the end of this time another small piece may be cut off and exposed as before. This time it may print grey, afterwards becoming purple; this is an indication that the paper is sufficiently fumed for all ordinary purposes. This sample of paper we have been using for the last few months requires thirty minutes' fuming, and a few years ago we were using paper which required an hour and a-half. Wheu there is much moisture in the atmosphere, and a weak silver bath is employed, a peculiar mottled appearance is sometimes seen, although the purple colour has been attained. This indicates the necessity for a longer period of floating on the silver solution, followed by a prolonged fuming until the blue stage has been reached. As a rule, paper should be floated until it is seen to lie perfectly flat on the solution, whether it requires three minutes or ten to obtain that result. When paper has been acted upon too long by the ammonia, also when not quite dry, a grey metallic lustre and generally flat appearance is obtained. Such prints will not tone well, neither will burnishing improve them very much.

On the subject of preserved sensitive paper I can say but little. Like others, I have made many experiments, ranging between citric acid of at least fifteen years ago, and carbonate of soda leaves of a later period. Although I have preserved paper perfectly white for more than a year, I cannot say the results are preferable to those obtained on paper freshly silvered every day. The formula used for preserving the paper I have just alluded to is as follows:—

After sensitizing in the ordinary way, and while the sheet is still wet, the back of the paper should be floated, for the space of five minutes, on the following solution:—

Picked gum-arabic	3 ounces
Water	100 „

When dissolved, add—

Citric acid	2 ounces
Tartaric acid	2 „
Stroug hydrochloric acid	2 „

The paper should be dried, and packed in a closed metallic case.

Vignetting is a troublesome operation unless onc is constantly practising; and amateurs, as a rule, would rather print their

* Continued from page 43.

pictures plain, than be bothered with cutting out and adjusting masks, without any very certain knowledge as to the results they are likely to obtain. Probably the shape is suitable enough if it were looked after; but the system of placing it in position, and leaving it to the glorious uncertainty of chance, is not a system favourable to good work. Who among us has not occasionally forgotten or neglected a vignette, and upon removing the print from the pressure-frame discovered too much this side, or too little that—a sort of one-sided effect.

I won't ask your permission to let me wade through the dozen and one different ways of obtaining a vignette, since a recent description of every practical method has been made familiar to us in the NEWS; but will merely mention that any suitable shaped opening in an opaque substance would give all the blending that can be desired, if placed in a diffused light at sufficient distance from the negative to produce a well-softened outline. An arrangement similar to the one I now show you answers very well for ordinary negatives.*

Example 5.—In a case of very thin or under-exposed negatives the opening may be covered with tissue paper, ground glass, or a plate coated with purple dye dissolved in collodion and spirit varnish. When the picture is half printed, should there appear to be any deficiency in blending, the smaller mask may be replaced by a larger one, and for some subjects a brief exposure may be given, removing the vignetting mask entirely. Some negatives will not give such good results printed out to the extreme limit of their dimensions, and it is not desirable to vignette them, neither is it convenient to print only so much as is really good, thus reducing the size materially. Under these circumstances a mask of the required size and shape, with plenty of margin, is secured to the faulty negative. Prints from this masked negative will have white margins. In everyday practice this white margin is given a tint somewhat lighter than the general depth of the subject. This is done in the following manner:—

Example 6.—The zinc shapes now being passed round wilbe found to exactly fit the paper masks, any number of which may be easily cut with a sharp penknife.

Two blocks of zinc are cut to the size of every shape used, one being a little smaller than the other. A mask is cut from sensitized paper from the larger zinc block, and the counter-part or inner portion is cut from the smallest block; the difference in the size of the two blocks being sufficient to enable the smaller one, attached to a glass plate, to block the picture entirely, and thus enable the margin to be printed deep enough to produce a pleasing effect without the necessity of a white line.

Cloud effects are produced in a variety of ways, the most practical being, to obtain a series of good cloud negatives, selecting the most suitable for the subject. Without wishing to dictate in any way as to which is the best method of printing in clouds from a negative, I will tell you which I think is the easiest.

Negatives having good density in the sky portion rarely require stopping out beyond ordinary shading. When the subject will allow it, a duster, or strip of thin sheet lead suitably arranged outside the pressure frame, will stop most of the light from passing through that portion of the negative. Some landscape and architectural subjects would be difficult to vignette in this way; nothing short of obscuring the whole of the sky by means of an opaque substance will be found to answer. The best medium I know of is black varnish. Care must be taken not to use it too thin and allow it to spread beyond the parts to be covered.

Example 7.—Having a print such as I now show you, it only requires to be exposed under a sky negative for a short time in diffused daylight, covering up the picture as much as can conveniently be done. The sky negative should overlap the subject a little, unless there are special reasons for not doing so.

Heavy shadows may be softened very effectually by means of dabbing an old brush slightly charged with black varnish on the negative. To facilitate working in foliage when insufficiently indicated, several retouching pencils may be bound together, thus multiplying the number of strokes with considerably less labour to the operator, and better effects are obtained than by using an ordinary stump and powdered graphite. Some photographers grind the back surface of their negatives to facilitate retouching; others attach tracing paper with the same object in view.

* A sketch will be found on page 631 of our last volume.

Combining portions of one negative with portions from another requires both patience and skill. It is easy enough to print the head from one negative on the shoulders from another; but it does not always look well, either a white or dark line caused by over-lapping or the reverse being very often too evident; vignetting does not produce any better result, and sometimes grave errors are made in the lighting. I have always succeeded better by cutting out accurately the portions required from untoned prints of the various negatives, using a sharp pen-knife for the purpose. If a line of any kind is perceptible when the parts are combined, it is better to let it be a white line, for this can be easily removed in the finishing.

There are a great many matters connected with this subject which might occupy the attention of our Society for several evenings. It is manifestly impossible for me to deal with more than a tithe of them just now.

Before closing, I wish to call your attention to a method of testing the quantity of silver contained in any given solution, preferably an acid solution. In this tube is placed some pure solution of nitrate of silver, and in this one silver solution plus nitrate of potash.

Example 8.—This mercury bulb, termed an argentometer, is so indexed that floating in distilled water at 60° F. it stands at zero. If 100 grains of silver nitate be added to each ounce of distilled water the bulb should register 100°; if I were to add barium or ammonium nitrate instead, I should get a very different result. The solution I am now operating with contains 10 grains of silver nitrate to each fluid ounce of distilled water. We shall find upon testing it with the argentometer that it does not register 9 grains. If this is so in the case of a pure solution, what degree of certainty can there be when operating with an old bath containing nitrates and albumen? I have also another solution composed of ammonium thio-cyanate 78 grains in 17 ounces of distilled water; this is the equivalent proportion to react, volume for volume, on a ten-grained silver solution. These burettes are graduated in cubic centimetres; I will run off 5 cubic centimetres of silver into this beaker, to it I will add a few drops of dilute nitric acid, and a colour indicator such as ammonia ferric alum. I will now run into this mixture exactly 5 cubic centimetres of the re-agent, and you will see the reaction is complete the moment the colour remains. Having a stock of the re-agent made at any convenient strength, preferably normal or deci-normal, the greatest accuracy is obtained in testing any given solution containing silver. Those who employ the French system of measurement will find it more convenient to use decinormal solutions, viz., 17 grams of silver nitrate per litre of water, and 7·6 grams of ammonium thio-cyanate per litre. The silver solution is merely used as a standard test for the re-agent. Each c.c. of the re-agent is equal to ·017 grams of silver nitrate, or ·0108 of pure metallic silver; thus in testing we multiply the number of c.c.'s employed to act on each c.c. of the silver solution by that number of times ·017. An easy way to ascertain how many grains per fluid ounce contained in a definite number of grains per litre, is to multiply by 70, and divide by 160; thus the decinormal solution of 17 grams of silver multiplied by 70 and divided by 160 equals 7 and $\frac{7}{16}$ grains per ounce—practically, 7½ grains per ounce.

CAMERA LUCIDA—PALETTA OBSCURA. A STUDY IN LIGHT AND SHADOW.

BY HUME NISBET.*

ALL good original work is got from copying and following those who have gone before. I could quote scores of painters since the days of Durer, Rembrandt, and Teniers, down to the present hour, who gain fame only through being Durerites, Rembrandtists, or Tenierians, with a little of their own personalities thrown in, as those old masters did. Durer flung in and mixed up a part of himself (which he could not keep out) along with the training of Michael Wolgemuth. Rembrandt hashed up Zwanenburg, Lastman, Pinas, with a host of others, along with the son of his own mother, to produce the mightiest giant of the art race, which we all try to copy whenever we want to feel free from the feeding bottle. It is the fate of all great men to copy. Blake says, "The difference between a bad artist and a good is that the bad artist *seems* to copy a great deal, and the good one *does* copy a great deal."

To imitate Rembrandt properly get hold of the first High

* Continued from page 39.

Street, Cowgate, or Leith basket woman that you can chance to meet—a herring or orange vendor will do—take her as she sits without arranging a single fold, adding to, or removing one iota about her; take her on the street or in the close, or as she squats down inside the half-darkened doorway of her own little shop. She can neither have too little nor too much about her if she struck you distiuctly while you passed as being picturesque. Never mind the lighting, or think to be original; as she stands, or sits, or squats, she is the woman for your camera; out with it, and secure her before she can wink or know what you are up to, and you have caught the whole secret of Rembrandt's power and realistic talent.

In patching and touching your plate, which to me seems to represent the second working, think upon all the dodges of the etchers—Hayden, Hamerton, Herkomer, Whistler, &c. If you have a chemical to eat down certain parts of it broadly, leaving the prominent parts (be sparing of prominent parts) standing out dense, do not niggle with your pencil point over much, except it is to blur out an accessory which may be too distinct. I do not know much about printing photographs, yet I am inclined to think it is here that the genius of the photographer may be brought out. If I were a photographer I'd never leave a plate while it was printing for a second. I'd try all sorts of dodges upon the sun with pieces of paper having little eccentric holes torn out where I wanted an artificial shadow to fall across my plate, by exposing the print altogether at times so as to mellow any extreme lights, painting touches of white on it to bar out the sun altogether where I wanted a mysterious gleam, whether it was on my picture or not, and never rest until I had made it my own. I may be wrong, of course, in all this; but it is the idea which now strikes me; or all that may be done already, or considered *infra dig.* or illegitimate; yet here, I think, as in the treating of a painted picture, I imagine the photographer can liberate himself entirely from the trammels of custom, and never be at a loss for fresh tracks.

In landscape photography I constantly observe good pictures rendered imperfect through the fatal power of the camera, which must print every object before it, and yet in the printing, even more than in the sorting, of the plate I think much, if not all of this, might be obviated by a careful study and following up of the tricks of Rembrandt. If it is the foreground which is too plainly marked, why not take another foreground plate, and clearing off all not required, place it over the other plate, and so let the sun strike through both and blurr that corner; or make a dark shower cloud, as in the engraving, "The Three Trees," by covering boldly portions of the plate with paper and allow the rest to print darker, or by adroit covering and exposing simplifying the whole arrangement and create divisions where you want them; a ray of light, or a part blackened, or any device that occurs to you, which is what we call inspiration?

The magic of Rembrandt rests in this, that he seldom creates, *but he takes advantage of circumstances and local incidents* to intensify the story he is telling you.

To return to Teniers (for a moment in passing), I cannot bring to mind one of his pictures which I have seen that could in any way be improved in the composition, added to, or taken from; every accessory tells its own portion of the general story, and this I would once more point out to the composer of a picture, along with a few wise laws which occur to me while I write. The principal object is the first object which rises up before the mind's eye, and fixes the composition when the story is heard or read; therefore the main object to be considered and first set up or drawn in. After we get the first object set up, the others all fall into place to suit that central or main object, and this rule holds with the arranging of light and shadow, as well as form—one minute centre of light through which the half-lights range—and the deepest shadow when you can best afford it. The central form, the central light is of paramount importance, all the rest a matter of convenience, chance, and discretion. Think less about what you may put in to help your picture as upon what you may keep out, to give it importance and repose.

Every sitter has a fine point about him or her—find it out. The best side of the face, a nice arm, or good hand—they will reveal it to you unconsciously, before you have sighted them; and make that your first object, and all the rest subordinate, and to help that out. Don't seize two points in one model; decide which is the most useful, and take that without regret, discarding all the others. It may be that the only good bit is a hat, or a feather, or a pair of gloves, or a brooch. The point that first attracts your eye pleasantly is the point upon which to make your centre of vision, and around which you will arrange the rest. If it is an article of dress, of jewellery, then bring the light to bear upon it, and make all the rest in half-shades.

Study nature for ever, if you would have any photographs you take different from the last photograph. Never take a sitter at once; leave them alone to knock about your studio while you pretend to be sorting something else, but watch them unawares; you will see a natural touch before long, a peculiar habit which they are not aware of, but by which many of their friends know them. Fix on that as your character key-note, and work up features, position, and accessories, so as not to lose sight of this peculiarity; and with this borne always in mind, and a good knowledge of face and neck anatomy, without which I cannot see how anyone can touch up a negative properly, I know of no reason wherefore a photographer should not give us as complete a character study as any painter, ancient or modern, from Millais back to Albert Durer.

Yet, before that state of perfection can be acquired, permit me, as one of the public and also as a frequent sufferer, to enter my protest against head-rests and long sighting, to those who still practise these abomiuations. No natural expression or easy posture can ever be gained until instantaneous plates are used for every one. Before they can well settle in their self-chosen places and posture, have them down and risk it—the chance of a spoilt picture is better than a conventional position; also this debasing system of smoothing away wrinkles, and blotches, and character traces. I never can see a real harsh, wrinkled face now-a-days, except in some of the tin-types.

Of course I know the cry is raised that the public will have those wax productions; but as one of the public I have not yet had my own likeness taken quite right. For instance, in repose, I hang my head on one side, and I have always been made to hold it straight up, like a soldier at "attention." Again, my nose is neither of a Greek nor Roman caste, and yet I never do get that nose put in as I see it in a mirror, or as its humpy shadow is cast upon the wall; or, as a gentleman once closed up a wordy, if not very convincing number of reasons against my having either the qualities to make a poet, painter, or passable labourer, by exclaiming, "Why, just look at your nose; did you ever know a clever man with a nose like that?" This photographed nose of mine has afforded me and others some amusement; sometimes it has been so refined that I fell to reviling Nature for being so far inferior to the artist who finished it off so well. Once it came home a splendid Roman, with the light upon it so intensified by pencil work that it stood out in bold enough relief to have won a Waterloo, if big noses could have done that. I have one portrait which I am keeping to leave to posterity; it is so Byronic and *spirituelle* that future young ladies will no longer wonder why my wife has married me. This refined likeness, and my love songs together, ought to do the trick.

Yet I have some photographs very near perfection. One representing my two little daughters, done by our friend Mr. Tunny. Professor John Ruskin writes:—"The face of the child on the spectator's right hand is the loveliest in expression I ever saw in a photograph." Also some by my friend Mr. John Foster,* of Coldstream, cattle piece, and landscape breathing of balmy atmospheric effect. He gets up to work outside, at three o'clock on summer mornings, the hour when Nature is like a blushing virgin, all dewy loveliness and purity. I have also works done by Mr. William M'Ghee,† of O. Davis, strong and massive, some by our member,‡ Mr. Samuel Tamkin, of Wood and Co., some by Mr. Pope, instructive and graceful; also one of Newhaven Fish Market, 8 o'clock a.m., by Mr. Knolles, the best group of artistic positions I have yet seen; and for the natural swing of one figure in it, to me a treasure priceless. Of course, I merely specify the works of those friends, as they are the only members whom I am yet acquainted with, or have specimens from, knowing well at the same time that they are only individual members out of a great Scottish army of earnest, original workers in art.

* The snow scenes are exquisite, and one exhibited of a camp fire with figures, a perfect triumph of misty refinement; the faces seen through the smoke particularly to be observed. I would also call the reader's attention to his cattle studies, and the printing done on rough hand-made paper, flat, and like sepia and Indian ink work, only far more refined than hand work could be.

† The two studies shown by Mr. M'Ghee are art portraits of my youngest daughters, a head thrown purposely (at my request) a little out of focus, so as to soften the effect.

‡ This enlargement, by Mr. Tamkin, is exhibited for the artistic vagueness and suggestiveness of this process when done with care and skill as in this case: the feeling of an Indian ink or charcoal drawing is thoroughly given.

In France there is a school rising—who with the brush are trying to compete with the camera—*the Impressionists*, who, along with the camera, are yet fated to produce a great revolution in art. They aim at giving the impression, effect, or sensation of an instantaneous action or emotion or phase; not the phase exactly, but the swift impression which it leaves upon the mind of the spectator, with form, as it were, that is, with paints and brushes striving to embody the soul of Nature, and when the two are joined, the result will be—*perfection*.

Correspondence.

DIFFUSED LIGHT FOR THE DARK-ROOM.

DEAR SIR,—Encouraged by the very satisfactory tests as to efficient dark-room illuminatiou in a recent number of the PHOTOGRAPHIC NEWS, I removed the two thicknesses of ruby glass from the window of my developing room, and replaced it with orange and ground glass, as you recommended. The orange used was, I suppose, of too pale a colour; at any rate, I found it admitted light enough to give me very fair transparencies by contact printing in frames, and I begin to think I must replace the ruby. To-day I tried another thickness of the same light-tinted orange, the ground glass being sandwiched between the two panes of orange. The result has astonished and delighted me. I can see to read diamond print six feet from the window; yet, on testing six of Rouch's rapid gelatine plates, by placing them in backs, the shutters of which were each half opened, and placing them *close to the window* for two, four, six, and eight minutes, each plate, when immersed in the hypo bath, showed clear glass, and had no trace on either of them as to which portion had, or which had not, been covered by the slide or shutter of the back. This trial was made at 1.30, when the sun was shining very brightly. It is right that I should add that my window has a northern aspect, but it is not screened by either trees or buildings.

I feel that I owe you a very large debt of gratitude.—Yours very gratefully, THOMAS BLAKE.

Lebanon, Ross, Herefordshire, January 17th.

LIGHT FOR THE DEVELOPING ROOM.

DEAR SIR,—A brief paragraph in your last issue has brought me a number of letters from persons interested in the proper illumination of the developing room. It is quite correct that gas lanterns, covered with one thickness of cherry fabric, having white tissue paper outside, have been in successful use here for a long time. The lanterns have glass about 12 by 8 inches, and the fabric is put on by pasting it round the edges in contact with the white glass. Then place the tissue paper on in the same way. The object of the tissue is to soften the light coming through the small openings in the texture of the fabric, and blend everything in one uniform tone.

I was probably misunderstood to have said this is also used in the dry plate works. This is not so. The most rapid plates may be developed close to such a lantern without danger. Probably some experimenters will try exposing a plate a short distance off for a long time, and then find it fogs. I am aware of that, and for that reason neither I nor ordinary people would keep plates close to it without occasion. The dark slides are of course some distance off the lamp, and the plate is quickly placed under developing solution, and all goes well.

Like many others, I have read recent utterances on the injurious effects of ruby light with some surprise. I thought that every one was now aware that ruby was unnecessary. From my own knowledge, I can say that in all the large establishments it is the practice to use large fixed lanterns with either gas or petroleum lamps, and either glass of lightish colour, or cherry fabric, to develop by. I should have said the use of ruby was abandoned.

In the Midlands it is the habit of most large houses to use lamps covered with canary medium, a piece of which I enclose. Notwithstanding its very light colour, it is perfectly safe, and may be used on a large scale. Searchers after "cathedral green" may save themselves trouble by using one or other of the above well-tested means of illumination.

Permit me just a word on the alleged injury to the human eye of the colours of lamps used in dry-plate photography. It is erroneous to suppose ruby or red injures the eyes; on the contrary, the optic nerves have an almost entire rest in them. Nor is it true that the focus of vision is changed. What really injures the eyes is the everlasting reading, writing, smoking, and glare of gas-light on white paper of modern life. Under the dry-plate system the life of the photographer is infinitely more hygienic than under collodion—the nerves are relieved from endless strain of worrying details of baths and collodion. Of course more spectacles are wanted as we all get older; but the number is not increased by the use of dry plates.—I am, very obediently, SAMUEL FRY.

PACKING PLATES.

DEAR SIR,—It may interest travelling photographers to know I have just finished developing about 120 ten by eight gelatine plates, exposed in British Columbia and the Rocky Mountains in the summer of 1882, and from which I have now about one hundred negatives, more or less good. The plates were packed in dozens in the ordinary way, each dozen put into a waterproof bag, and then packed with straw, in two one-inch boxes lined with tin, which were soldered up when done with. On repacking after exposure, I laid the first plate film downwards on the packing paper, and the other plates film downwards upon each other with nothing between them. The plates with the film next to the paper got a good deal scratched, but only in two or three cases sufficient to show upon the print, whilst the others were not at all the worse. I had not a single case of leakage, although on one occasion, both boxes, together with the horse on which they were packed, rolled about thirty feet down a steep rocky incline. Nor did I get any of the plates fogged, though I often had to change under a blanket in a tent in bright moonlight.

When rightly exposed and developed, the plates do not appear to have suffered the least from the long time which elapsed between exposure and development.

As a result of two years' travelling experience, I intend this year to take for a six months' trip in America, an 8½ by 6½ camera, 20 inch single, 13 inch rapid, and 8 inch portable symmetrical lens, 20 dark slides, charged before leaving home, each one in a waterproof bag, and every two in a telescoping tin case, with a tight india-rubber band round the join.

Besides these I shall take forty-two plates packed in half dozens, film to film, with a mask of thin blotting-paper between each plate, and shall repack them in the same way. Each half dozen will have its own waterproof bag, and the seven bags will be packed with straw or tow in a three-quarter inch wooden box lined with tin and soldered down. I shall thus only have to change plates once during the whole journey, which will save an immense amount of aggravation and bad temper.—Yours truly,

B. H. BUXTON.

NOTE ON PHOTOMETRY.

SIR,—I would like, with your permission, to correct an error appearing in your report of the last meeting of the Photographic Society, in reference to the adjourned discussion upon my paper on a "New unit of light in connection with sensitometry." My reply was to the effect that, having tried various sources of illumination, my experience enabled me to say, that with plates of *uniform* composition, but differing in sensitiveness, the relative time

required to produce a corresponding minimum effect upon either of them remained constant, the result being independent of the composition of the light employed. On the other hand, when comparing plates differing in their composition with any given source of light, the relative time necessary to produce a corresponding minimum effect upon each does not remain constant when a comparison is made with any other source of light differing in composition to that employed. This difficulty I propose to surmount by employing a constant. The result obtained when comparing plates with any given source of light would then have to be multiplied by the constant corresponding to the difference that exists between the light used, to that you intend to employ with the plates.

Kindly allow me to add in reference to the above that I have been giving great attention to this subject for the last three years, with the result that I have more complete apparatus than that described, which is based upon the same principle.—I remain, yours truly,

JAMES B. SPURGE.

P.S.—These conclusions are embodied in my paper printed in the Society's Journal, vol. vii. (new series), page 160, lines 16 to 35.

THE MIXED HYPO AND GOLD BATH.

SIR,—I am glad to see our old friend, the mixed bath, is being stirred up again. Old photographers are beginning to find the prints they made five-and-twenty or thirty years ago retain their colour and tone much better than those of more recent date.

Since the discussion on Mr. Ashman's paper, I have looked up some prints I made over twenty-three years ago. I am able to fix the date to a day, as they were printed and hurriedly finished with very little washing, to take with me to Dublin; as I sailed and crossed the Channel the same night the *Royal Charter* was lost on the Welsh coast, I well remember the time. These prints were made the day previous, and would be in October, 1859.

The prints have, as Mr. Ayres remarked, been kept "anyhow." Others in the same scrap-book, toned by the alkaline method, though not half the age of these, are anything but satisfactory.

The danger of returning to the old method is, in economical or inexperienced hands, the toning with sulphur instead of gold, as upon the exhaustion of the gold, the bath seems to tone equally well. Only allow a certain quantity of gold per sheet of paper, and I think we need not be afraid fading prints will be returned to us during the time even the youngest photographer amongst us will remain on duty.—I am, yours, &c., T. G. WHAITE.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

ON Tuesday last, the 22nd inst., the mid-monthly meeting was held in the Gallery, 5A, Pall Mall East, Captain ABNEY, Vice-president, in the chair.

Mr. H. J. NEWTON'S method of accelerating, as described on page 35 of our issue for last week, was brought under discussion, and both Mr. Cowan and Mr. Ashman, who had very carefully tried the method, came to conclusions identical with those which we had previously arrived at, the addition proposed by Mr. Newton acting merely as an intensifier, and not serving to materially reduce the exposure required. A practical disadvantage is, however, the circumstance that a precipitate of subiodide of mercury forms, and settles upon the plate. The deposit thus formed appears itself to become intensified in some way, and firmly fixed to the film. The addition proposed by Newton is, however, not to be recommended under any circumstances until the image is well out.

Mr. DEBENHAM then brought forward a lantern in which one side was glazed with a thickness of orange glass and one of ground glass, covered with a thickness of stout white paper; another side of the same lamp being provided with a thickness of cathedral green and yellow paper; these gave a light about equal as to visual brightness, and experiments made by Mr. Debenham indicated that the actinic action of each was about the same. A thickness of cherry fabric and one of tissue paper gave a light somewhat difficult to compare with those previously mentioned; however,

Mr. RAY WOODS thought it more brilliant, but the actinic action was certainly greater.

The CHAIRMAN referred to the chromates of lead as non-actinic media. He had tried them made into gelatinous emulsion and precipitated into the pulp of paper, and had not found them very satisfactory. He pointed out that ordinary white light may be used in the developing room if it be considerably reduced in amount, and precautions be taken to prevent undue exposure of the plate; indeed, he had often developed a plate in full gaslight by taking the precaution of keeping his back to the light. The canary medium by itself is not good when iodide plates are used, as much green passes. On the whole, the Chairman considered the so-called stained red to be one of the best mediums to employ when a single thickness only is used. Ordinary ruby allows so much blue to pass as to make it a very unsafe medium.

Mr. COWAN had obtained an excellent and very safe light by allowing gaslight to impinge on a sheet of tin plate, and after reflection to traverse yellow paper and cathedral glass.

A question was then read, having reference to the desirability or otherwise of soaking a plate before development, and the

CHAIRMAN said that, when working in extremely hot and dry climates, there is a decided advantage; indeed, if the film be not soaked, one practically loses the effect of half the exposure.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE sixth general meeting of the Association was held in the Religious Institution Rooms on the 10th inst., Councillor ROBERTSON in the chair.

The minutes of last meeting and of the conversazione were read and approved of.

The CHAIRMAN then invited the members to inspect a number of platinotype prints lent by the Platinotype Company. These were very much admired, and several gentlemen testified to the simplicity and workableness of the process.

Mr. PATON said it was the simplest process he had ever tried. He had had no trouble from the very first, and showed some excellent specimens of work in proof of his statements. He also showed some portraits printed both on albumenized and platinotype paper for comparison; but the general feeling of the meeting was that the gloss of the albumen print gave it an advantage over the platinotype for portraits. Mr. Paton said he had twice tried to enamel the platinotypes, but had not been successful; he thought the paper supplied by the Company was not suitable. The prints always had a greasy appearance after enamelling.

The question was then asked whether solar enlargements could be done on platinotype paper?

Mr. MCLELLAN said it would be quite possible to do it, but that a very long exposure would be required. It would be much more satisfactory to make an enlarged negative, and enlarge from that.

Mr. PHILSON showed some enamelled silver prints in accordance with his promise at the meeting on the 22nd November, when a discussion arose as to the best method of mounting enamelled photos. Some of the prints exhibited (Mr. Philson explained) were mounted with starch before being stripped from the glass. The others were mounted with gelatine along the edges; the surface of these were slightly dulled, however, where the gelatine touched the back.

Mr. PATON also showed some enamelled prints mounted with gelatine. These showed no mark of the mountant, owing to his having used a thick paper to back up the print when enamelling.

Some discussion then took place concerning the permanency of enamelling photos, and the general opinion of the meeting was that enamelling very much increased the permanency of silver prints.

The CHAIRMAN said he had noticed a camera advertised by the Scovill Manufacturing Company, in the *New York Photographic Times*, the principal feature of which was the revolving back, which enables the operator to make either an upright

or oblong picture after he has the plate in the slide. This was advertised as Hanning's patent, a truly novel instrument. He said that statement was hardly correct, and exhibited one on exactly the same principle made for him fully twenty years ago, which had also the advantage of moving, so as to take eight pictures on one plate without changing the position of the lens.

Mr. BLACKLEY said he had heard neither of Councillor Robertson's nor the Scovill Company's cameras, but he had had one made quite recently on the same principle, which he would exhibit at the next meeting.

Votes of thanks were then awarded to the Platinotype Company, to Messrs. Paton and Philson, and to the Chairman.

The meeting then terminated.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 17th inst., Mr. A. HADDON occupying the chair.

Mr. W. E. DEBENHAM showed a wood dipper intended for vertical fixing baths, somewhat similar to Mr. Henderson's sliding stud dipper, the base or cross-piece being much wider in this case, thus enabling two 20 by 16 inch plates to be fixed at one time. Two grooves in the base, and transverse slots running at measured distances from the main slot, enable the plates to be firmly secured by the stud.

Mr. A. COWAN exhibited a 7 by 5 camera on behalf of Mr. York, the novel feature consisting in being able to swing the bellows (conical) whenever it is desired to alter the position from vertical to horizontal, by means of a revolving plate attached to the sliding front, a sliding piece in baseboard permitting the range of focus being extended from $2\frac{3}{4}$ to $17\frac{1}{2}$ inches, at the same time conferring rigidity. He (Mr. Cowan) considered it a most compact camera, and having neither swing front or swing back, should, after the recent discussion, be named the "York camera."

Mr. J. N. HARE: Does not the small conical bellows cut off a portion of the picture? He had seen a form of reversible gusset simpler than the one shown.

Mr. COWAN said it did not matter how small the cone of the bellows is, provided it does not obstruct the margin of the lens.

Mr. A. MACKIE: Is there any advantage in using a swing and rising front over a swing-back?

Mr. COWAN: The amount of back swing would be more than the front; he noticed that a swing of a quarter of an inch in front produced apparently greater effect than the same amount of swing at the back.

Mr. MACKIE: In the cases of swinging the front and raising it, the central line of rays would reach the centre of the plate.

Mr. DEBENHAM contended that the effect of swinging either the front or back of a camera would practically be the same, and illustrated his views by means of diagrams on the black board, in which he clearly showed that neither had an advantage over the other.

Mr. MACKIE said that in using a lens that would only just cover the plate, he thought that in photographing a high building there would be an advantage in using the swing and rising front over tilting the camera and swinging the back.

A discursive discussion ensued, in which both Mr. Debenham and Mr. Mackie illustrated their remarks with diagrams.

Mr. H. S. STARNES brought a modification of his lamp before the meeting, the sides of which were of cardboard or stout brown paper instead of wood; the upper and lower portions are made of block tin, so arranged that the paper or cardboard can be easily fixed in position when required; an ordinary visiting card placed in front of the candle flame shields the room from white light. The body of the lamp being lined with transparent tissue paper of a suitable colour is said by Mr. Starnes to emit a safe light into the apartment.

Mr. R. E. Wilkinson was elected a member of the Association.

AUCKLAND PHOTOGRAPHIC SOCIETY.

AT a meeting held in Rolison's Commercial Rooms, Auckland, New Zealand, on the 2nd of November, the Auckland Photographic Society was formed, and the following officers elected:—

President—J. M. Clarke.

Vice-Presidents—W. J. Hurst, M.H.R., and John Chambers.

Secretary—J. H. Sinclair. *Treasurer*—Clement Bartley.

The first field day of the Society was held on Saturday, the 24th of November, in the Domain, and the weather being fine, a number of photographs were taken.

Talk in the Studio.

MESSRS. NEGRETTI and ZAMBRA forward us their new catalogue of photographic apparatus, which, among other matters of interest, contains particulars of reversing prisms for photo-mechanical work.

THE DECAY OF ENGRAVING.—The *Daily Telegraph* confirms the plaint of the Fine Art Company, that photographic piracy is destroying the art of engraving. "The extent of the evil done may," says the *Telegraph*, "to a slight extent be guessed when we find the representative of the Society stating that, in the course of four years, his firm have published six engravings, for the copyright of which the artists received more than seven thousand pounds, while the cost of the engraving amounted to over ten thousand. Within a month of the issue respectively of these prints, photographic copies of them were hawked about for half-a-crown apiece." It then continues to say, that "engraving on metals is, at the present day, menaced on all sides. It is threatened by 'photogravure,' a process of which it may be said that 'it would be engraving if it could,' and, again, by etching, the development of which during the last twenty years has been simply astounding. But the most formidable and the most unfair competitor of chalcography is the sun. Photography will never completely kill portrait-painting, for the reason that human vanity is eternal, and that the sun never flatters—indeed, in association with the lens of a camera, it often distorts, exaggerating facial uncomeliness and putting arms, legs, and hats disastrously out of focus. The sun, however, when it is an engraving that has to be focussed, is a pitiless and unerring forger. With microscopic fidelity the minutest touch of the dry point, as well as the boldest stroke of the graver, will be transferred to the plate of the negative and thence to the paper of the the positive. Finally, the sun is wondrously successful in forging engravings executed in the 'mixed' manner—that is to say, in a combination of etching, line, stipple, and mezzotint. It seems clear enough, however, that if photographic forgeries of costly engravings continue to be sold by the 'sneak' pedlars at half-a-crown apiece, we must be within measurable distance of a period when there will be no more new engravings for the sun to forge. The print publishers will abandon the unequal contest in despair; and the artists will cease to net handsome sums by the sale of their copyright." Seeing that the Fine Art Company, on its own showing, has only published six engravings in four years, few artists will suffer, even when the present state of things do come to an end. Our contention is, that if painters, as in France and Germany, published more frequently through photography, an enormous majority of them, and not only a few, would benefit by their copyrights, while piracies would be far less frequent.

EMPLOYES DINNER.—On Thursday evening, January 17th, by the kind consideration of Mr. Norman May, photographer, his employés, with a few of their friends, were enabled to spend together a few very pleasant hours of social recreation. The party numbered in all about 25; they assembled in the new, handsome, and spacious rooms of the Beauchamp Hotel, where a bountiful and elegantly-served repast was provided. The time that remained after dinner was filled up with mutual congratulations, songs, and merry chat; all enjoying themselves heartily. —*Malvern Advertizer*, January 18, 1884.

DETECTION OF CHLORINE, BROMINE, AND IODINE.—Mr. Francis Jones, F.R.S.E., writes:—"I have lately introduced a method (suggested to me by the process employed on the large scale for the manufacture of iodine and bromine), which is based on the same principle, but carried out in a simpler and more convenient manner, and which serves extremely well for the detection of the three elements. The process is carried on in the following way:—Place a *small* quantity of the mixture to be tested in a good sized test-tube, add a few pieces of manganese dioxide, and then a little water. Add now *one* drop only of dilute sulphuric acid (one part acid to ten of water); a brown tinge indicates the presence of iodine. Boil the mixture, and confirm the presence of iodine by the violet vapours in the upper part of the tube. Continue the boiling till these vapours cease to appear, then add another drop of sulphuric acid and boil again till they cease. If necessary, repeat this addition of acid and boiling until violet vapours have entirely ceased. Now add about two cubic centimetres of the dilute acid and boil again: brown vapours indicate bromine. Continue the boiling until the vapours no longer smell of bromine, then add one cubic centimetre dilute acid and boil again. When the vapours no

longer smell of bromine, allow the residue to cool *completely;* add an equal bulk of *strong* sulphuric acid, and warm; a green gas, bleaching a piece of moist red blotting-paper at the mouth of the tube, indicates chlorine. Occasionally some bromine comes off on addition of the strong acid, but if so it is soon got rid of, and is succeeded by the chlorine, which is chiefly evolved on warming the mixture. As, moreover, moist red blotting-paper is far more quickly acted on by chlorine than by bromine, there can be no difficulty in distinguishing between the two elements. I have compared the results obtained by my students when using this and other methods, and find they are far more successful with the new method."

PHOTOGRAPHIC CLUB.—At the meeting on January 30th, the subject for discussion will be "The Preparation of Lantern Slides." This being also an evening devoted to the exhibition of slides in the lantern, members and visitors are invited to bring interesting subjects to be shown.

To Correspondents.

*** We cannot undertake to return rejected communications.

*** *Reprint of the first number of the current volume.* Subscribers are informed that this is in hand, and will be ready shortly.

JOHN WHITELAW.—The sectional drawing which you send corresponds to an ordinary quarter-plate portrait lens, and it may serve very well for a beginner. If you find it on trial to be a fairly good lens, it may probably be worth 20*s.* or 30*s.*; but if you simply purchase it at a shop, and take the risk of faults, you should not give more than 10*s.* to 15*s.* The front lens, if placed in a reversed position in the back of the mount, will serve for taking views on 5 by 4 glasses, or even on half-plates.

SOUTH DEVON.—1. You will find a drawing and all the information you require on page 449 of our volume for 1882. 2. From any dealer in photographic apparatus.

J. CHAMLEY.—1. They are not manufacturers, but merely described the method of working the process. Write to the Platinotype Company.

THOS. BLAKE.—1. We cannot altogether agree with the opinions of the writer referred to. 2. Mischief is not likely to occur unless the plate contains chloride of silver; but in any case it is well to take the precaution of examining them in a subdued light.

W. S. MOON.—Reference was made to his papers on photo-lithography, most of which were published in the PHOTOGRAPHIC NEWS during the past year.

E. WILLIAMS.—The difficulties you refer to are very real; but you must not expect too much of an extremely rapid lens.

A. H. E.—Nothing is better than a strong mucilage freshly made from the best gum-arabic.

AMATEUR (Croydon).—It is a solution of bitumen in benzole, a small proportion of fine lamp-black being usually ground up with the mixture. The "liquid jet" sold by Messrs. Hopkin and Williams is a simple bituminous varnish without the pigment.

THOS. R. WEST.—It should not be so hot as to be unpleasant to the back of the hand.

F. STOKOE.—We cannot tell you of a certain method of reducing it under the circumstances; but the knowledge you have gained will serve to prevent the occurrence again.

INQUIRER.—1. You may probably obtain them by advertising for them. 2. Quite a matter of opinion.

X. Y.—Simply a false pretence: difficult to detect, certainly, but punishable as a fraud, if money is obtained by the untruthful representation.

B. AND G.—Write to Mr. Eastman, Dry Plate Works, Rochester, New York, U. S. A.

S. K. HUGON.—From the Willesden Waterproof Paper Company, Willesden Junction, London, N. W.

A. B.—1. We will consider the matter, but should not undertake it without making a series of experiments in order to clear up certain points which appear doubtful at present. 2. As much fluoride of sodium as will rest on a threepenny piece, dissolved in 10 ounces of water, and about a drachm of bisulphate of potassium, will serve as a convenient substitute.

OPERATORS' SPECIMENS.—Specimens forwarded by the following in answer to advertisements, may be had on application at our office:—E. Trapnell, W. James, E. Spencer, and J. G Pratt.

AGRICULTURIST.—1. The camera you describe is evidently an extremely old-fashioned one, and it possesses but little commercial value. We should recommend you to purchase one of the cheap quarter-plate cameras which are now in the market. 2. You will find the addresses of several firms in our advertisement columns.

J. S.—You would find it convenient to arrange with a patent agent as regards the foreign patents. Most agents issue some kind of scale of fees, inclusive of agency charges. Consult the Directory for list of agents.

S. SAMUELSON.—1. Try the effect of considerably reducing the exposure. A very good method will be to draw the shutter one-fourth of the way up, and to expose one second; after which you can draw it up half-way, and expose for three seconds, and so on. 2. Iron sash bars will take the putty very well if they are well painted before they become rusty. 3. Chloride of copper.

COLLOTYPIST.—Chrome alum may be added, but you must be careful not to overdo it. A convenient way is to make up a solution containing 5 grains to each ounce, and to add them as required. Under ordinary circumstances your batch of mixture should not require more than half a drachm.

M. T. R. DUTTON.—The silver solution has doubtless penetrated the porous body of the ware, and rendered the vessel quite unfit for further use; glass is much to be preferred.

CHROMATE.— It is nearly insoluble in strong alcohol, but a mixture of equal parts of alcohol and water will dissolve sufficient for your purpose.

J. HARVEY.—1. We have never heard of large surfaces being covered under such circumstances. It would be better to retouch the negative. 2. They answer as well as anything we know of.

J. F.—We cannot judge unless we know something of your qualifications.

C. G. TODD.—1. There is often a tendency to blister if the paper is extremely dry when floated on the sensitizing bath. Try the effect of hanging the sheets up in a cellar or other damp locality for an hour or so before sensitizing. 2. The collodion is probably over-iodized for the bath you are using, and the remedy is either to increase the strength of the bath, or to use a little less iodiser in mixing your collodion. 3. Chloride of silver dissolves readily in a solution of ammonia, hence the result which appeared so incomprehensible to you. 4. It should be prepared by dissolving unvulcanised india-rubber in benzole, and the solution ought to be of such a consistency as to flow slowly over a plate. The most suitable rubber to employ is that which is sold as "masticated rubber," and care must be taken that real benzole is used, and not the light petroleum which is sold under the name of benzolino. 5. The most satisfactory method of preventing the adhesion of the electro deposit is to silver the original, but an extremely thin film of silver will answer the purpose. To a thirty-grain solution of silver nitrate, add sufficient of a saturated solution of cyanide of potassium to re-dissolve the precipitate which is first formed, mix the liquid with sufficient whiting to form a thick cream, and rub this upon the copper by means of a tuft of cotton wool.

C. BURLSDEN.—1. Ultramarine is ordinarily used, and it is merely intended as a "foil" against the yellow tint of the material.

The Photographic News Registry.

Employment Wanted.

Salesman to photo. & frame makers.—L. W., 18, Plantation-rd, Oxford.
Operator, colourist, &c.—S. George, Sherwood-villa, Brunswick-pk., N.
Neg. Retoucher, lady.—M. F., Gaskell's, 15, Sussex-rd., S. Kensington.
Reception-Room or Shop.—C. M., 2, Dover-ter., Dover-st., Sittinghourne.
Retoucher, Lady, first-class.—E. M., *Photo. News* Office.
Spotter & Mounter.—Miss Stewart, 2, Albany-ter., Bournemouth.
Retoucher & Spotter.—L. F., 30, Swanmore-rd, Isle-of-Wight.
Silver Printer, first-class.—F. G., *Photo. News* Office.
Reception-Room, Lady.—F. W., 16, Chrystell-rd., Brixton.
Retoucher (Lond. only), c/o. J. S. Cockerton, 2, Hanover-pl., Regent's-pk.
Retoucher & Assistant Operator.—Artist, 19, Waterloo-st., Southsea, Hants
Carbon Enlarger, Painter, &c.—G. Fischer, 54, Berners-st., W.
Recep. room and manage (Lady).—Rembrandt, 5, High-st., Ryde, I.W.
Retoucher, work-up black-and-white (Lady).—W. J., *Photo. News* Office.
Operator, manager.—A. E. Walker, 118, Abbeyfield-rd, Pittsmoor, Sheffield
Operator or manager.—W. D., 2, Nursery-vils, Bounds-grn, New Southgate
Assistant (Lady), tint, spot, &c.—A. G., 5. Heaton-vil., Heaton-rd., S.E.
Collotype Printer, expe.—E. Birch, 3, Alpha-ter., Boston-rd., Hanwell.
Operator and Retoucher, or to manage.—Operator, 18, Telford-rd., W.
Mounter, Spotter, Books (Lady).—A. E. G., *Photo. News* Office.
Opera. & Retouch, all branches.—Pyro, 1A, Prince-of-Wales-rd., Norwich.
Operator and Retoucher.—Manager, Eastover House, Bitton, near Bristol.
Assistant Operator.—A. G. R., Rosetta Cottage, Weeks, Ryde, I.W.

Employment Offered.

Enlarger for general work.—D. S., *Photo. News* Office.
Dry-plate man, first-class.—Dry plate, 37, Thornton-st., Brixton.
Operator and retoucher.—F. Baum, c/o Disderi & Co., 4, Brook-st., W.
Female Assistant Printer.—F. Baum, c/o Disderi & Co., 4, Brook-st., W.
Painter in Oils, Club work.—K., *Photo. News* Office.
Printer & Toner, good Vignetter.—Mr. Vanderweyde, 182, Regent-st., W.
Photo-litho. Oper. (transfers, collotypes.).—Stewart, *Photo. News* Office.
Lady, Youth, and Apprentices.—2, The Pavement, Clapham Common.
Assistant Printer, to reside in house.—W. J. Anekorn, Arbroath, N.B.
Youth, to sensitize, mount, &c.—Turner & Killick, 10, Barnsbury-pk., N.
Saleswoman and Stock-keeper, to spot, &c.—J. E. Bliss, Cambridge.
Retoucher, first-class.—W. McLeish, 71, Northgate, Darlington.
Young Lady Printer.—Gartside and Risley, *Photo. News* Office.
Retoucher, clever.—J. Hawke, George-st., Plymouth.
Dry-Plate Coaters, experienced.—Prestwich, 155, City-rd., E.
Photo-lithographer, experienced.—Photo., 150, Queen Victoria-st., E.C.
Photo. expe. largest cameras.—E. Meyerstein, 280, High Holborn, W.C.
Retoucher, for high-class work.—Mavius and Vivash, 49, Ann-st., Belfast.
Operator for N.W. Provinces, India.—India, *Photo. News* Office.
Photo. Artist, first-class, all-round hand.—W. Knight, 47, Coney-st., York.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

VARIOUS CLEARING SOLUTIONS FOR NEGATIVES.

THE past year has seen a considerable advance in the means placed at the disposal of the photographer for obtaining negatives developed by the alkaline pyrogallic method which show none of the yellow colour that, until recently, was considered a necessary quality of a pyro-developed gelatine negative.

All must well remember the plaints of the poor printers about three years ago, when the use of gelatine negatives became general, and how they grumbled about the deceiving appearance of the negatives, and the time it took to get a dozen prints. In enlarging, the drawback of the bad colour was felt almost more than in printing.

The matter is changed now. We venture to say that in the greater number of the best photographic studios the pyro-developed negatives which are handed to the printers take little, if at all, longer to print than did the wet plate negatives of the olden times.

The habit of always using the alum bath, which was first introduced merely as a means of preventing frilling, has had much to do with the change. Many kinds of plates, if simply treated with alum between development and fixing, give a colour as good as can be desired, but it is to be noted that some require a little more than this. It is not generally known how much difference there may be between one film and another in regard to their liability to take the yellow stains of the pyro developer. We have exposed two plates by different makers for the same length of time in the camera—the sensitiveness was about the same—and have afterwards developed them side by side in the same dish. The development went on at about the same rate in each case, and no difference was noticeable between the one plate and the other till after fixing, when one was found to show only the faintest trace of a yellow colour, whilst the other was almost brown in the shadows.

Treatment of the first plates with alum before fixing made them give negatives of perfect colour. The others still showed considerable yellowness, even when treated with a neutral alum solution.

This difference was not merely accidental, but was noticed at all times between the plates of the two makers.

We have found that even those films which tend most of all to yellowness will give a good colour if the alum used before fixing be rendered a little acid. An alum bath so strongly acid as is often used for clearing after fixing, has the effect of very materially reducing the density of the negative if used before fixing; but one composed as follows does not have such an effect:—

Saturated solution of alum	1 pint
Citric acid	1 dram

We have advantageously used such an alum bath before fixing, and have found the result to be that all plates gave us negatives of excellent colour. It is necessary to be careful to wash the plates thoroughly after they have gone through this bath, and before they are placed in the fixing solution, otherwise it would appear that the acid has some decomposing action on the hyposulphite of soda. If a plate which has been treated with the acid alum solution be rinsed but slightly, and then be placed in the fixing bath, a powdery deposit may form on the film. This is presumably some form of sulphur.

As regards clearing solutions to be used after fixing, we have found that of all the various mixtures of alum solution and acids which have been proposed, few give a better result than the following:—

Saturated solution of alum	1 pint
Hydrochloric acid	1 ounce

This mixture appears to act quite as well as one in which the hydrochloric acid is replaced by citric acid, whilst it has the advantage of being much cheaper.

This acid solution, like all others that we have tried, has the property of somewhat reducing the density of the negatives which are treated with it. This may be a great advantage at times, but at others it is the very reverse.

Mr. B. J. Edwards recently introduced a clearing solution, for which he claimed that, whilst it gave a favourable printing colour to a negative, it in no way reduced the density. The solution which Mr. Edwards recommends is mixed as follows:—

Alum	1 ounce
Citric acid	1 „
Sulphate of iron	3 ounces
Water	20 „

The negative is to be treated with this solution immediately after fixing, and slight rinsing under the tap; that is to say, the hyposulphite of soda is not to be entirely washed away.

We have recently been using this solution, and find that, applied as Mr. Edwards directs, it leaves nothing to be desired. Used in place of the ordinary acid clearing solution as the latter often is—that is to say, on a negative which has been fixed, thoroughly washed, and possibly dried—it appears to have little advantage over the older method.

We have also been more successful in performing silver intensifications with this solution than with any other which we have tried. The negative to be intensified is *thoroughly* washed to get rid of all hypo; it is then placed for some minutes in the solution, the formula for which we have just given, and afterwards flowed with a small quantity of the same solution, into which has been dropped a little of a twenty-grain solution of silver nitrate.

If the negatives to be intensified be quite clear in the

shadows, we have found no difficulty in intensifying them in this manner up to any desired extent. But if they be even a little fogged we have found great difficulty, as, in such a case, the shadows appear to intensify almost as much as the high-lights.

There is a stain quite different in nature from the ordinary pyro stain, which, although it resembles it somewhat in appearance, is in reality a much more objectionable phenomenon. It usually comes when a negatives has been imperfectly fixed—when, perhaps, all the visible bromide of silver has been dissolved away, but when there has still been left in the film a certain portion of some silver compound. The colour is not evident at first, but comes on after the negative has been exposed to the light and air for a few days. It is rather a fog than a stain. A stain covers a negative as well in the denser as in the more transparent parts, although it may be most visible in the latter, and therefore has no effect but to make it somewhat slower in printing. A fog, such as the one in question, appears to attack the shadows only, or at least more strongly than it does the high-lights, and thus, reducing the contrast, ruins the negative.

The ordinary yellow pyro stain is generally pretty evenly distributed over the film. The fog which we mention is usually confined to one portion, namely, the one which has been the last to fix. For this reason it is more detrimental than it would otherwise be.

It is not acted upon by either citric acid and alum, or hydrochloric acid and alum. We have, however, found that it will generally give way to a solution prepared as follows :—

Saturated solution of alum	1 pint
Nitric acid	1 ounce

PRESERVING SENSITIZED PAPER.

THE custom existing some fifteen or twenty years ago, to employ a concentrated solution of silver nitrate for the purpose of rendering albumenized paper sensitive to the rays of light, can by no means be considered an axiom only of the past, since we have it recorded quite recently that practical men—such as Valentine Blanchard, Frederick York, and others desirous of conferring keeping properties to the sensitive surface—invariably start with a liberal quota of the silver salt. An analysis of all the published methods will be found to result in a general average of sixty grains of nitrate of silver to each ounce of the sensitizing solution.

Besides the evidence adduced by those practical photographers who preserve their paper, and make no secret as to the way in which they do it, we find the commercial papers themselves are rich in silver nitrate, giving a further proof, if such were wanting, that the best results are only obtained by a judicious, and not a cheeseparing expenditure of silver. There is no necessity to go to either of the extremes, such as sensitizing on a bath 80 or 100 grains strong, as at one time almost universally employed for ordinary work, or the excessively dilute five-grain bath mentioned at one of the recent society meetings. That a reliable method of preserving sensitized paper in a most perfect manner is not generally known, must be apparent to most of us. We all understand the method of preserving with citric acid, and, perhaps, some may have found a little difficulty when the operation of toning took place ; this little trouble may be easily avoided by adopting Mr. York's suggestion, viz., to soak the prints in an aqueous solution of carbonate of soda, after washing away the free silver, and before toning. One per cent. will be found a good strength to make the soda bath, and five minutes will be ample time to neutralize any acid left in the pores of the paper.

Many other acids have been from time to time recommended, such as nitric acid, oxalic, perchloric, also some of these acids combined with an alkaline base, together with alum, camphor, borax, various gums, glycerine, and other substances. We have also the bicarbonate of soda method published in these columns as far back as 1871, and which is, perhaps, the most convenient plan of all. A neutral sensitizing bath is employed, the exact strength of which is not very important, so long as good prints can be obtained in the ordinary way. The most important thing to observe is, to well dry the paper before packing away between the sheets of bibulous paper, which have previously been soaked in a seven or eight per cent solution of bicarbonate of soda, and thoroughly dried afterwards. If carefully packed away in a moderately air-tight case, such paper will keep a long time ; the bibulous sodic papers doing duty over and over again.

There is no difficulty whatever in toning prints which have been preserved by means of the sodic paper ; but there is at times a mottled appearance, caused either by acidity of the sensitizing bath, or dampness, or both. Possibly the occurrence of this defect occasionally may be the means of deterring many from adopting this method, for the convenience to have paper always ready is great indeed. We are inclined to think albumenized paper keeps white after floating for a longer period than formerly without any extra precautions being observed. If it were washed and fumed in the manner we advocated some years ago, we see no reason why sufficient stock could not be prepared on a dull day to last three months or longer.

ISINGLASS, GELATINE, GLUE, AND SIZE.

A DISTINCTION is often made between the above-mentioned substances ; but, in reality, no very sharp line of demarcation can be drawn, and the term gelatine fairly includes all of them. Of the chemistry of gelatine we propose to say nothing, except to remark that it is a highly nitrogenized animal substance, and therefore quite distinct in its nature from the so-called vegetable gelatines, such as agar-agar, Irish moss, or the so-called thio. We shall have a few words to say about these *quasi* gelatines on a future occasion, but shall now confine our remarks to the true gelatines of animal origin.

Isinglass, which is the most expensive kind of gelatine in the market, is the swimming-bladder or sound of various kinds of fish, and the principal yield is obtained from the sturgeon. Isinglass is used by some for the preparation of collotypic plates, and the circumstance that it yields a very structureless film is in its favour. We are not aware that it has been employed to any great extent for emulsion work ; but some years ago we prepared some plates with isinglass instead of the cheaper gelatines, and the result was very satisfactory, the films being extremely uniform, and no tendency to blistering was noticeable. Considering the small quantity used in plate making, the high price of isinglass should not prove an obstacle to its use.

Ordinary gelatines may be classified into bone gelatines on the one hand, and skin gelatines on the other, the former being ordinarily made by soaking the bones in dilute hydrochloric acid to remove the mineral matter (principally calcium phosphate), and boiling the residue with water until solution takes place. A little alum is generally added in order to separate fatty matter, and the hot solution is allowed to set, after which the jelly is cut into flakes, and allowed to dry in a good current of air. Skin gelatine is made from cleansed hides in a similar manner, only the preliminary treatment with hydrochloric acid is not required ; but it is very usual to fume the skins with sulphurous acid in order to whiten them. Excessive heating is carefully avoided in the manufacture of gelatines, as, otherwise, the setting power of the material becomes less, a considerable proportion passing over into the condition of soluble gelatine or meta-gelatine ; when a gelatine is made from dirty or partially decomposed

material, or if an undue heat has been employed in its production, it passes into commeree as glue. Many impurities may be removed from gelatine by mixing white of egg with the slightly warm solution, and then heating to about 160°, in order to coagulate the albumen, which then separates as a kind of scum, and carries with it fatty and other impurities. The white of one egg will serve to clarify half-a-pound of gelatine. In ordinary cases, manufacturers do not clarify even the fine kinds of gelatine with egg albumen, but they make use of the low-priced albumen obtained from blood.

The commercial value of a gelatine depends mainly on its setting power and the strength of the jelly produced. Eder's method of testing gelatines, which has already been fully described in the PHOTOGRAPHIC NEWS, may be again briefly described.

The samples to be examined are dissolved in nine parts of water, and all the jellies are allowed to set in similar beakers, the temperature being adjusted as near to 15° Centigrade as possible. The resistence of each sample is now measured by a convex disc or cup about half-an-inch in diameter, to the inside of which is attached a metal stem surmounted by a funnel. The convex disc is now laid on the surface of the jelly, and the stem is steadied by a suitable guide, while the funnel is gradually loaded with shot until the disc breaks into the jelly; the sample which resists the greatest weight being the best.

DIFFUSED LIGHT FOR THE DARK-ROOM.

DR. VOGEL writes us:—"I have repeated your interesting experiments on the illumination of dark-rooms, and in the main with the same results; but I must remark that all kinds of orange glass are not suitable for the purpose. The first I tried was lightly tinted, and I did not succeed with it at all. Another darker kind, which absorbed all the most refrangible part of the spectrum, was better; but I must confess that I cannot agree with you when you say that the spectroscopical results contradict the photographic ones. It seems so, but it is not so.

"I compared carefully the absorption of the ruby glass and the orange glass for the red part of the spectrum, and observed easily that the orange glass absorbed *decidedly more* of the red rays than the ruby glass. That gives an explanation. Red rays do really act on the ordinary gelatino-bromide film (I obtained a photograph of the red line of the hydrogen spectrum three years ago), and therefore it is easy to suggest that the very bright red light which a ruby glass lets pass will have about the same chemical action as the dull red, yellow, and green rays together, which an orange glass, combined with ground glass, allows to pass.

"I worked nearly in the same way as yourself. I exposed bromide plates under a Warnerke screen for two minutes, to a fish-tail burner, at a distance of a meter, and covered the screen with ruby glass first, then with orange and ground glass combined. In both cases I got the same number (10). The illuminating quality for the naked eye I determined by covering one of my paper photometer screens with the glasses above mentioned, and observing the last number, which I could recognize when looking through. In this way I could recognize No. 6 behind the ruby glass, and No. 8 behind the orange and ground glass combined.

PHOTO-ENGRAVING PROCESS.

OUR readers will remember the specimen of Klic photo-engraving process which we issued with the YEAR-BOOK for 1882.

The process itself was a secret at first, but we are informed that the principle of working is as follows:—

A copper plate is dusted with powdered asphalt, and the plate is heated, so that the asphalt becomes nearly melted. A negative carbon print is now transferred on to the copper plate, and the plate, now covered with the negative in carbon, is etched, at first by a strong solution of perchloride of iron, which penetrates only the thinnest parts of the picture; then by a weaker solution of the same salt, the solution etching through the thicker parts. By employing more and more diluted solutions, it is possible to etch through thicker and thicker layers of gelatine, so that only the high-lights remain unetched.

One advantage of the Klic process is the circumstance that the plates are very quickly finished. Goupil, who takes an electrotype from a grained relief, requires several weeks for depositing metal of sufficient thickness. The etching process of Klic is rapid, and plates may be produced in a day or less.

Obernetter's Photo-engraving Process.—The eminent photographic chemist, Obernetter, of Munich, to whom we are indebted for so many improvements in photographic matters, has invented a quite new process, which gives results like Goupil photogravure. He has sent excellent proof-pictures by his process to the Society for the Advancement of Photography in Berlin.

The most striking feature of the Obernetter prints is the richness of the tone in the lights, and the principle of the method is stated to be as follows. A diapositive is made by the Obernetter method on a plate containing a maximum of silver and a minimum of gelatine, and the film, having been stripped, is treated with a mixture of perchloride of iron and chromic acid, so as to convert the whole of the silver into chloride. This film, charged with chloride of silver, is now placed in contact with a copper plate, and the copper gradually decomposes the silver chloride, metallic silver being liberated. This decomposition of the chloride is of course accompanied by a corresponding etching of the plate.

The new principle now published is an important one, and we have found that if a collodion positive or an ordinary gelatino-bromide transparancy is converted into a chloride picture by suitable means, it easily etches a copper plate with which it is pressed in contact. We found the method described by Mr. E. de Zuccato in these columns to be the most convenient for converting the silver picture into chloride, viz., treating with a mixture of dilute hydrochloric acid and bichromate of potassium.

If the film, before being placed on the copper, be moistened with a weak solution of chloride of zinc, the etching proceeds more rapidly than otherwise.

We are not aware that the new method of etching copper plates has been patented in this country, and we hope our readers will try a few experiments with the process, and let us know the result. It is scarcely necessary to say that the method is also adapted for the production of high or typographic plates, but in this case the lines of the chloride of silver picture must correspond to those parts of the block which are required to print white.

Those who are interested in producing typographic etchings on copper will find an article treating of the subject on page 338 of our last volume.

By-the-Bye.

STUDIO DRESSING ROOMS.

THE studio dressing room is a more important feature of the studio than people imagine. Even photographers who have shown taste and tact in the fitting of these retiring rooms often have but limited ideas as to their use, while many more regard them as altogether superfluous. Of course, the sitter who pays but five shillings a dozen for his pictures can hardly expect the same appointments and the same handsome fittings as are found in studios where one or two guineas is the fee simple; but he may be treated

with precisely the same consideration, and the best the studio affords should be given to him as to every visitor alike. In a word, whatever the rank or degree of the studio, there is no reason why order, neatness, and discipliue should not be rigorously observed; these have nought to do with the wealth or poverty of the establishment, but are simply the signs of a good and painstaking manager.

We have always regarded the dressing-room as a ready means of showing the sitter polite attention. Your reception room may be gorgeously upholstered, hung with attractive paintings, and furnished with luxurious settees and sofas; but all this is done for the glorification of the establishment, rather than for the comfort of the visitor. In a way, it is a species of advertisement. The sitter regards it all with something of admiration and awe, and communes with himself over the prosperity of the establishment. Nay, the graudeur around often tells plain Mr. Smith that the least he can spend, in these circumstances, is a five pound note, and presently he hands over this amount with a smile to the young lady in charge of the books, although but ten minutes before, as he came up stairs, he had fixed his outgoing rigidly at a guinea. We repeat, money spent upon a grand reception-room is disbursed with something of the same feeling that prompts the physiciau to set up his elegant carriage and pair, and causes the secretary of a public company to secure handsome premises in a handsome thoroughfare. The reception-room is part and parcel of the business concern; the dressing-room on the other hand, let it be as elegant as you please, is a sort of discount to the payment, and a welcome solatium in case this payment is deemed high. You desire, or at any rate you should do so, to render your sitter every attention—to assure him, that since he has placed himself in your hands, you will take every care of him, and treat him courteously iu return for his confidence. How can all this be done better than by placing at his disposal a neat little private room? A sitter feels at once that there is something here tendered him outside the hard-and-fast bargain, and he values the attention highly. It is like giving a man a good cigar; it is one of the cheapest, as it is also one of the most genuine, compliments you can pay.

As well-appointed dressing rooms form part of nine studios out of every ten, it may seem that these remarks of ours have been forestalled by photographers. This is not so, however. We are well aware of the existence in most establishments of dressing-rooms, and in our "Studios of Europe" we have again and again complimented photographers on the taste and elegance with which these are fitted. In Mr. Fergus' studio at Largs, we found no less than five dressiug-rooms *en suite*, all of them bright, clean, and admirably appointed. In like manner the chief studios of London, Paris, Berlin, Vienna, &c., were supplied with suitable dressing-rooms, the principals in most cases, indeed, taking exceptional pride in this part of their establishment. But to judge from our experiences on the other hand, as one of the public, it is very certain that many photographers do not make proper use of the charming little boudoirs into which we have been ushered time after time, on presenting a card with the name of this journal upon it. We fear, sometimes, the manager is too careful of these private apartments. He dreads letting everybody into the well-furnished little chambers, and so it happens that only now and again a sitter is shown into them. At any rate, this fact speaks for itself: that of six London studios visited by us last year, as a paying sitter, in only one case was the invitation extended to us to walk into a dressing-room.

We have little doubt that a lady, entering the half-dozen establishments we visited, would have been differently treated in this respect. But it is not this point at all that we want to urge on the attention of photographers. In no case were we received otherwise than with courtesy. What we want to urge, however, is, that a studio which does not make full use of the advantages it possesses, acts with unwisdom. Here it is, in a position to confer certain compliments and attentions, and yet fails to do so. Not once in a dozen times, probably, will a gentleman sitter find it necessary to make any alteration in his dress, but he none the less desires to look at himself before posing before the camera. This, it is true, he can do very well in the studio itself, at a glass usually placed for the purpose, and if his hair wants brushing and smoothing, the latter operations can equally well be gone through while the assistant waits beside him. But human nature tells us all this will be hurriedly and awkwardly done, and often at some self-sacrifice of respect. A grown-up man doesn't like everybody to watch his toilet: he is much more reticent over it than his wife or sister, for he is not supposed to possess those little vauities and conceits that woman is heir to. Nevertheless, when a solitary wisp is all that is left of his raven locks, or the grey whiskers require a comb to lend them the ambrosial curl of yore, he prefers to make the best of what is left him unwatched and unseen. There is very little to do, perhaps, but he does not care to parade his weaknesses, for all that. Besides, he wants to put his cravat straight, to be quite sure his collar is down at the corners, and that his shirt front has not that crease across the breast where he knows it inevitably comes if he does not mind. A lady would use powder and hare's foot with the greatest nonchalance, where the lord of creation shrinks to comb his moustache. Now all this, of course, is very childish, and very petty; unfortuuately, it is a fact, and it is a pity, therefore, photographers do not recoguize it. That they do not, is proved by our own experience, for we found that in most instances a lookiug-glass and brush and comb in the studio are deemed to fulfil every requirement. If a gentleman, when he comes, hurriedly looks into the mirror, and sits down in the posiug chair without delay, he does this as much from nervousness, or from a fear of appearing ridiculous, than from any other reason.

The photographer prides himself on the idea that in posing, he himself takes eare that nothing in the sitter's toilet is awry, but the former knows nothing of his visitor's idiosyncrasies or tender points. At any rate, the photographer cannot value the persoual fads of the sitter so highly as the latter, and therefore a little thing that escapes the artist's glance may condemn the picture in the eyes of the model. For this reason, we hold that gentlemen and ladies alike should be invited to enter a dressing-room, if the photographer desires them to receive every attention.

There is an intermediate plan which is sometimes adopted on the Continent, and which is certainly better than the looking-glass and brush-and-comb arraugement. This is to have a recess or alcove iu the studio, into which the sitter may retire for a few moments while the assistant is getting ready. The sitter is out of sight of the photographer while making a last survey of his features and dress, and there is not the formality or loss of time involved in entering a dressing-room. Only, it is very necessary in this case, as the alcove is apt to get dusty and dingy, that scrupulous care is taken to keep everything here neat and clean. Better, a thousand times, have no toilet conveniences at all, than have them doubtful as to cleanliness.

In some studios it is customary to have a moveable toilet table, which, after changing a pose, is wheeled in front of the sitter, in case she (for it is rare that a gentleman requires the aid of a mirror and powder, or hair-brush, at such brief intervals) may wish to re-arrange her headdress or make other alteration. In this case the toilet-table must be of elegant shape and fitted with taste and exceeding care, for the fierce light that beats down into the centre of a studio displays unmercifully any signs of slovenliness.

But we have no need to insist upon neatness and cleanliness—there should be, by-the-bye, as few things as possible in the dressing-room—for a want of these has never proclaimed itself in any studios we have visited. Our principal aim has been to point out the shortsightedness of photographers who possess well-appointed dressing-rooms, and do not use them; to all sitters alike, gentlemen as well as ladies, should the invitation be given to enter them, for it does not by any means always follow that those who seem least to care for personal appearances are least fastidious over their toilet. The photographer should remember that the very essence of the sitter's visit is to perpetuate his personal appearance, and it would be strange indeed, therefore, if he were absolutely indifferent about his toilet on such an occasion.

The By-the-Bye next will be "Success in Photography."

A Dictionary of Photography.

ALBUMENIZED PAPER (Printing on).—*Continued.*

Washing by simply soaking in a tub or pan with frequent changes of water is a method largely practised, although somewhat tedious and laborious; but a simple expedient of attaching one corner of each print to a cork, as suggested by Major Senior in a communication to the Photographic News, is a valuable one, as this arrangement tends to keep the prints vertical in the water. Major Senior says:—

Arrange a cask, A, and a tub, B, as in drawing, regulating the run of the water from the two taps, C and D, so that as much water will run off at D as enters the tub B at C. The tub, B,

Fig. 3.

must be full of water, and the prints, having been toned, fixed and washed in one or two changes of water, so as to get rid of the superfluous traces of the soda, they are suspended by one corner to clean corks by means of pins; two pictures to one cork, as a rule, will be best—viz., one on either side of the flat ends. Common sense will suggest to the operator to attach the pictures so that the surplus portion of the paper of the print will be near the cork, and to do the trimming after the washing and drying.

Major Senior's idea may be improved upon by not only pinning one corner of each print to the cork which is to serve as a float, but also pinning to the diagonally opposite corners of the prints to the loaded corks. The best way of loading the corks is to cut a piece of lead tubing into rings by means of a saw, and to slip one of these over each cork. Small phial corks may be used in each case. Unless one corner of the print is loaded it sometimes happens that air-bells which form upon it cause it to float up and lie horizontally upon the surface.

Hypo Eliminators.—To avoid the tedious operation of thorough washing, it has been suggested to change the chemical composition of the salts left in the paper after fixing, and thereby destroy the property they possess in such a high degree of rendering the print evanescent. It has been shown that this result may in a measure be attained by immersing the print, after fixing, in a dilute solution of either lead nitrate, *eau de javelle*, or common potash alum. As these eliminators are not so much in favour with every-day practitioners as they are with the experimental portion of the community, we will merely indicate the method of employing them, thereby opening up a field of further research for the student if he desires to avail himself of it.

The lead solution is made by dissolving one ounce of lead nitrate or acetate in eight ounces of warm distilled water—two ounces of the above solution to each gallon of soft water will be found to be a workable proportion. A stronger solution will change the tone to a cold slatey colour, and a weaker one will not bring about the required decomposition. That such has taken place may be known by the solution becoming cloudy.

The prints should be immersed in the bath for the space of five minutes, keeping them constantly moved about as in toning and fixing. At the end of the time stated, remove them to a vessel of clean cold water, give them three changes in all, separating each time, when they will be ready for drying and mounting.

Eau de javelle is made as follows. With three quarts of water mix half-a-pound of dry chloride of lime, then dissolve one pound of carbonate of potash in one quart of water; mix the solutions, and filter for use. Four ounces of the above solution to each gallon of water will be a very good strength to use; treat in the same manner as lead nitrate, or acetate.

Alum.—Make a saturated solution of ordinary potash alum; of this use four ounces per gallon of water, and allow the prints to be moved about for ten minutes, then wash in several changes of water.

Mounting.—There are several systems of mounting in vogue among photographers, but they may be all classed under two headings, and for convenience we will call them the dry and wet methods. The first-named of these consists in drying the photograph (an operation to be mentioned hereafter), applying some such substance as good starch paste in a manner calculated to give an even surface free from grit, hard clots, hairs, &c., and either attach it to the cardboard or other support immediately, or permit it to dry spontaneously, attaching it to the mount at any time afterwards that may be convenient. If the amateur desires the latter plan, he must proceed as follows:—Pass a wet sponge twice over the cardboard mount where the photograph is to rest; place the print in the required position, and press it gently to ensure its retaining that position. Having done so, pass them both through a rolling-press, which completes the operation. The photograph should be uppermost, and the operation performed quickly, to prevent any chance of tearing under the roller; one advantage this system has over others being that no unequal stretching takes place in the print.

The second, or what we will term the wet system, may be briefly stated thus:—Each print should be placed separately, face downwards, on a clean wet linen cloth, the superfluous water being blotted off by the same; then the mounting substance applied to the backs of as many as can be conveniently managed—say three or four—after which they are placed in the desired position on the mount, and pressed down by means of a paper-knife and sheet of white paper; the operation being repeated so long as any prints remain on the cloth. Whenever possible, we advise two persons to perform the operation, one to apply the mountant, and the other to attach the print to its support; it will not only make the work more agreeable, but it will reduce the chances of the albumenized surface being touched with some of the mountant, provided both persons are equally careful. Should such a mistake occur, the excess must be removed immediately by means of a wet sponge, as it may interfere with the after-operation of burnishing, &c.

Another plan is to transfer the print from the final washing water to a glass plate, albumen side being downwards (as many as fifty, or more, may lie on the top of each other without danger); drain for a few minutes; the top print may then be brushed all over the back with some of the mountant, lifted by a corner, and placed in its proper position on the mount. It should then be well rubbed down with the paper-knife until even—a piece of writing paper placed between the photograph and knife during the rubbing prevents scratches or tears—apply some of the mountant to the next, and repeat until all are finished. This will be found a very convenient mode when only a few dozen are to be mounted.

Mountants.—For various reasons it is probable that no better mountant is used for attaching photographs to substances such as cardboard than a good starch paste, made in the usual manner for laundry work, viz., mixing Glenfield's, or any other good class of starch, with a little cold water until a very stiff paste is obtained; then add *boiling water* (stirring vigorously) until a clear paste results. Should the paste not be of a good consistency—viz., rather limpid—discard it, and make fresh,

using a little less cold water to mix the starch; and be sure the heated water to be added is at a temperature of 212° F.

Two ounces of dextrine mixed with half-a-pint of cold water, and added to the above starch paste in equal proportions, the mixture being heated on a water or steam bath to 212° F., is said to make a very strong and useful mountant for photographs; it is an excellent adhesive, is not easily affected by moisture, and more useful for mounting photographs in scrap books than starch alone. Next in order of merit is thin glue, to which should be added a small proportion of an antiseptic, such as salicylic acid. Many large firms of photographers have not used any other mountant for years.

PHOTO-LITHOGRAPHY AND PHOTO-ZINCOGRAPHY.

BY MAJOR J. WATERHOUSE, B.S.C.,
Assistant Surveyor-General of India.

CHAPTER XVI.—NEGATIVE TRANSFER PROCESSES.

THE next processes to be noticed are the collochromate transfer process, in which, instead of a greasy image, the colloid ground is transferred, leaving the image itself in reserve on the stone or zinc plate, to be inked up by the application of a roller or pad charged with printing ink, which attaches itself on the lines where the stone or plate is bare, but not on the parts where the colloid coating has been transferred.

One of the earliest processes of this kind was published in the NEWS, vol. vii., page 414, by Mr. Joseph Lewis, of Dublin, who, as we have seen, was an ingenious and fertile worker in the early days of photo-lithography. His method is as follows:—

A jelly is formed consisting of—

Water	...	...	...	4 ounces
Gelatine	...	...	...	1 ounce
Glycerine	...	...	...	1 drachm

with bichromate of potash to saturation at 80° F. The solution is filtered carefully, then spread on glass plates, and allowed to stiffen till the surface will not stick to the dry finger or to the negative plate placed against it. If the upper surface be not smooth, the film may be reversed on to another plate or cardboard. It is exposed to light under a negative for a few minutes, and then laid face downwards on a clean lithographic stone, and gently pressed into contact all over; this requires some dexterity. The time the film should remain in contact with the stone varies according to circumstances. When judged sufficient, the film is lifted off, and the stone rubbed over with re-transfer or printing ink. The ink is washed off with turpentine and gum water, and the stone inked in and printed in the usual way.

The best known of these methods is, however, that patented in June, 1863, by Mr. W. Toovey, of Brussels, in whose hands the process gives very perfect results, both in line and half-tone; but it requires special appliances for giving the heavy pressure required, and some skill in adjusting the amount of moisture to be given to the transfer.

The specification of Mr. Toovey's patent will be found in the NEWS, vol. viii., p. 158. The following is an outline of it. Smooth, even paper is coated with a solution of gum-arabic in pure water, saturated with bichromato of potash. When dry, the paper is exposed to light behind a negative, so that the parts forming the image may become insoluble. The exposed print is then laid face downwards on a polished or grained stone, according as the subject is in line or half-tone, and previously arranged in a hydraulic or other powerful percussion press. Several sheets of damped paper are laid over it, and the whole exposed to a heavy pressure, so that the water in the damped paper may be forced through the photographic print, and dissolve the gum in the unexposed parts of the sensitive coating, which has, therefore, remained soluble. The dissolved gum attaches itself to the stone, while the exposed parts, being insoluble, protect it. When the stone has remained in the press a sufficient length of time to allow of the small traces of gum in the deepest shadows attaching themselves to the stone, the pressure is removed, the stone withdrawn from the press, and the paper carrying the photographic print is carefully lifted up, leaving a bare negative image on a gummed ground. The stone is then well dried, and covered all over with oil or greasy ink, applied with a roller or otherwise. The greasy ink is thus brought into contact with all parts of the stone unprotected by the gum. The coating of ink is washed off with turpentine, and all the surface gum removed by washing. The stone is then rolled in with ordinary lithographic printing ink, which brings the positive image in black, and it may be printed from in the usual way. Owing to the great pressure, the gum and bichromate are forced into the stone to a considerable depth, and prepare it so completely that there is no necessity for "etching" in the usual way with gum and nitric acid, and the stones will stand an unusually long impression.

The same method is applicable to zinc.

Captain Hannot, in writing on this process in his book already quoted, draws attention to the necessity for the gum used in this process being of the most soluble quality, and free from acidity. It is well to take large lumps of the best gum-arabic or Senegal, and having washed off the hardened outside coating with warm water, to use the inside for making the solution; a lump of lime or chalk may be added to keep it neutral.

In vol. viii. of the NEWS, p. 197, there is a description taken from *Les Mondes* of two similar methods of transferring an uninked collochromato print, proposed by M. de Lafollye, as a means of avoiding the loss of half-tone and fine details that occurs in the processes in which the collochromate image is inked and washed.

Paper is coated in the usual way with a solution of gelatine or gum and an alkaline bichromate, and exposed to light beneath a negative.

The exposed print is then floated face upwards on a water-bath so that the moisture may penetrate and soften the unexposed parts of the image, while the solarized parts, being insoluble and impervious to water, will remain dry. At a certain point, to be ascertained by experience, the print is removed from the water, and may be transferred to the stone in two ways.

The first is to place it face downwards on a lithographic stone and apply pressure. The paper is removed, and leaves, as in Toovey's process, a reserve of gum in the lights, while in the shades the impermeability of the surface prevents the gum from adhering to the stone. The stone may now be dried and inked with a roller, but the following method of inking is recommended. A clean stone is coated evenly with transfer ink; a sheet of autographic transfer paper is laid on the inked stone, and being passed through the press receives an even coating of ink. The inked sheet is now laid over the gummy image on the stone, passed through the press, and afterwards wetted so as to be easily removed. The ink will attach itself only to the bare parts of the stone, and not to those protected by gum. The stone is then washed and inked in as usual.

In the second method, which is, however, not strictly a negative process, the exposed print, moistened as before to just the proper point, is placed, image downwards, upon a stone that has been rolled in with transfer ink, and is passed through the press. If the sheet were dry its whole surface would be covered with ink, but it will be found that where the moisture has penetrated the gummy coating the ink will not attach itself to the paper, while it does so in the impervious parts forming the image, and in proportion to the amount of the action of light upon them.

The inked transfer print is freely washed with water to remove the soluble bichromato and any slight soiling of the whites. In washing, care must be taken not to use the slightest friction, which might damage the finest parts of the image. The print is then dried and transferred in the usual way.

M. Lallemand, in his "*Nouveaux Procédés d'Impression photographique et de photolithographique*, describes a method of negative photo-lithography, and observes that by the action of an alkaline bichromate, gum becomes less soluble, while gelatine becomes more so. Papers prepared with gelatine are therefore not suitable for this process as those prepared with gum, either alone or mixed with linseed mucilage, and he gives the following formulæ for the sensitive coating:

1.—Sat. sol. bichromate of potash ... 100 parts
Thick gum (2 gum arabic, 3 water) 50

2.—Sat. sol. bichromate of potash ... 100 parts
Thick gum 40
Very thick linseed mucilage at ten per cent 20

By well heating, the mucilage seems to become thinner, and solution No. 2 is not thicker than No. 1.

Paper is floated over the mixture. For very fine results albumenized paper may be used, or paper coated with a single coat of

Water	..	...	...	... 500 parts
Gelatine	...	...	...	... 50
Alum	...	...	...	... 5

The paper when dry is exposed to light under a negative. After exposure the print is laid in a damp book and taken out as soon as it is limp. It is placed gently on the stone, and made to adhere to it by means of a small roller. The back of the print is then wetted very lightly with a sponge, taking care not to use too much water.

After one or two minutes the corner of the paper is raised to see if it comes off easily, and if an even coating of gum has been transferred to the stone, and when the time is considered favourable, the paper is gently removed. If the operation has been properly conducted, the stone will show a negative image of surprising delicacy and sharpness. The borders are gummed, and when the coating is quite dry, fatty ink (by preference a solution of resinate and oleate of iron in benzole) is applied to the stone, and the other operations are the same as in the processes previously described.

In another method suggested by M. Lallemand, the exposure given to the bichromated gum paper is only a few seconds. The print is damped and transferred to the stone as before. The back of the paper is then very slightly moistened, and it is allowed to dry in the dark-room. After about an hour water is applied to the back of the print, and when the paper becomes detached, the gum is washed off with plenty of water. The stone is left to dry, then inked all over, damped, and cleaned up with the roller. This method is also negative, and the gum prevents the ink taking on the ground, while the layer of insoluble gum forming the image prevents the soluble gum from acting on the stone. When the image has been brought well out with the roller, it is etched with gum and acid, and is then ready for printing.

M. Lallemand remarks that the great point to be observed in all these processes is not to moisten the exposed print too much before transferring it to the stone. If the surface is allowed to become sticky or soft, the fine lines will be blocked up. The paper should just be limp, and the pressure applied will make it adhere to the stone.

(*To be continued*).

AN AID TO THE PERMANENCY OF ALBUMEN PRINTS.

BY WILLIAM L. COLLIE.

I WENT into a sale room the other day, and amongst the books was a work published twenty years ago containing a large number of stereoscopic views of Egypt and its Temples (chiefly) by Frith. I am always curious about photographs, and open to take a lesson. The work was full of the photographs, which, with exception of only several, were all in a fine state of preservation. Frith had always been a careful and good printer, and these prints did him credit. What had been originally pure whites, though, namely the skies, had a light greenish tint, but not spoiled or faded like. The rest of the images, including high-lights (but not the highest as in skies), such as of walls, pillars, statues in pure sunshine, had the original colour—a warm purple white; whilst the half-tones and deepest shades were all tints between a purplish-brown and black. In fact, the images were as rich in tone as they were twenty years ago. No doubt they had been protected in the book from the changing effects of light and heat; but still the prints showed a triumph for albumenized paper.

But what I learnt from these prints was, that the parts (such as skies) that in printing had been entirely shielded from any light by the perfect opaqueness of the corresponding part of the negative had changed to a light pea green; whilst the parts that had been affected in the least degree (or to the deepest), and therefore had taken on even the smallest coating of gold in the toning bath, showed not a particle of change or green tinge; in fact, the contrast between the sun-lighted stonework and the sky was quite striking in every instance.

The two lessons I deduce from the above are, first, that the gold is a perfect protection, not only to the shadows, but also to the very lightest tinge in white that can be produced on albumen; second, that a pure white from corresponding opaqueness of those parts in the negative has no protection of gold, and is found to change to some tint according to the original preparation and composition of the albumen coating. In some cases the changes will be, as in this instance, to a cool pea green; in others, to a light ochrish-yellow tint, &c. This also tallies with a well-known fact that the pure whites round the vignettes require longer or stronger fixing than ordinary lights in prints, otherwise the white quickly changes.

Now the practical observation from the above is—"pure whites are not safe, but must change."

Again, and lastly, the practical suggestion is, "If you want your prints not to change at all, the albumenized paper or print must be exposed all over to light just sufficient to make it take on the least coating of gold in the highest lights. The whole print, you will observe, would thus be protected by gold. The loss of absolute whiteness in the highest lights need scarcely be observed, and in the case of harsh and hard pictures, there would be really an improvement by the method.

Notes.

New Zealand has beaten Australia in forming the first photographic society at the Antipodes; as we reported last week, the Auckland Photographic Society held its first meeting on November 2.

The Society of Photographers' Assistants formed a year ago at Vienna has met with extraordinary success. There are no less than two hundred members now belonging to this body, which has a location of its own, and holds regular meetings for the discussion of techical and scientific progress. The only other active body of this nature seems to be the New York Association of Operative Photographers, although it is true there is in Zurich a Schweitzer Photographen Gehilfen Verein, of whose doings, however, one hears very little.

Those about to build studios may be interested in knowing the experience of a correspondent. He has two studios, an iron-framed one, the other with ordinary wood sashes. The first has been built about seven years, the second about twelve, and both were the best of their kind so far as workmanship is concerned. His experience is that while the iron studio has never leaked since it was first put up, the wood one has been a constant source of trouble, despite paintings and puttyings every other year. It is only just to the wood studio to say that the pitch is not so steep as it might be; but, after making allowance for this, the superiority of iron frames seems evident.

Mr. Norman Macbeth, of the Royal Scottish Academy, has designed an emblem for the Edinburgh photographers, which is likely to find favour beyond the Scotch capital. Here is a description of it on the best authority:—

"Photography is represented in the character of a female figure—as the daughter of Nature, Science, and Art. She is seated with a mirror in hand, having a pure reflection of herself seen in it. She has the greatest abhorrence of everything that is false and concealed. She is represented as having torn the mask (which many would live by) from her face, and, being ashamed of such attempt at deception, she hides it behind her back. Everything that comes from her hand has a relation or bearing on Natnre, Seience, and Art. These are indicated by the presence of the sun, moon, stars, insect life, and the head of Arthur's Seat (the lion), all which make up the motto surrounding her."

We hear a good deal of Mr. Barnum's white elephant, and, so far as "word-painting" is concerned, the portrait of the beast has been before us many a time. Still there is an idea abroad that the elephant is not so white as it is painted. In these circumstances, it is strange that a master-showman of Mr. Barnum's standing should not have bethought himself of the camera, and had his elephant properly photographed. We say "properly photographed" from his point of view, because that point of view might include the application of a little whitewash. Surely Mr. Barnum must have forgotten the dictum of his countryman Artemus Ward, wherein he tells us it is true that the leopard cannot change his spots, but you can do it for him.

Dr. Huggins last week broke a lance with the *English Mechanic*. In a resumé of the Progress of Photography in 1883, our contemporary observed, *à propos* of Dr. Huggins' photographs of the solar corona, obtained from the uneclipsed sun: "It is now suspected that the pseudo-coronal structure visible in his negatives may have its origin in reflection from the dark backing of his photographic plates, such backings being painted on with a brush." This statement brought forward a letter from Dr. Huggins, couched in what the journal itself characterises as "strong language," and elicited the explanation that the editor had not seen any of the photographs, and founded what he wrote "on information derived from a gentleman who had himself examined some of Dr. Huggins's earlier negatives, which, in his opinion, showed indubitable traces of reflection from the backing of the plate." As it appears, however, that the varnish was spread with a flat wooden spatula, and not a brush, the editor admits that his supposition with regard to the brush marks was incorrect.

The following is a good plan of enamelling cardboard or pasteboard, according to the *Papierzeitung*. Dissolve ten parts of shellac in a sufficiency of alcohol, and add ten parts of linseed oil; to each quart of the mixture add also a quarter of an ounce of chloride of zinc. The cardboard may be immersed in this solution, or the latter may be applied with a brush; before application, however, the paper surface must be polished with sand or pumice powder.

The *Times* can be very comic when it likes. Last week we mentioned the fact of photographic apparatus having been dispatched to the French army of occupation at Tonquin, and our leading contemporary now gives further information. The cameras are part of the balloon equipments; for, according to the *Times*, "a complete photographic apparatus is attached to each car, which can turn out 100 impressions a second, and printed instantaneously." This sounds exceedingly important, although scarcely so clear as it might be; but in describing what the balloon equipment and corps is wanted for, is where the *Times* makes its point. "It is intended to act specially in ambuscades, and is attached to the artillery."

Fancy lying in ambush with a balloon! Our American humorists in their wildest fancy never invented anything half so funny, while the ostrich, hiding his head in the sand, appears, by comparison, the emblem of cunning. But the French balloons are evidently not ordinary balloons, for they have no gyration—the knotty problem that plagues all photographers—and will probably be able to do without ballast, for, adds the *Times*, their equipment includes "the new electro-magnetic balancing bar, which prevents the balloon from gyrating, and, it is expected, will be the means of eventually dispensing with ballast." Perhaps "the new electro-magnetic balancing bar," besides doing away with gyration and ballast, also renders the balloon invisible when the detachment is to "act specially in ambuscades!"

A very old photographic swindle has been revived in Leicestershire and the adjoining counties. Fellows have been going about the country pretending to photograph the mansions of the principal residents, and in some cases taking the portraits of members of their families. Of course, in pursuance of the good old photographic custom, the money was demanded beforehand, and this having been obtained, the "photographers" immediately decamped. The police have been on the look out for these gentry, who gave a false business address in Nottingham, but without result.

We can recal an instance, however, where a kindred deception was practised without any swindle being intended. A photographer who could not afford to keep an

assistant was compelled by family affairs to be absent from his studio a whole day. It was in the height of summer, sitters were certain to call, and the loss of a day's takings was a serious matter. Luckily, a friend, who was somewhat of a "cool hand," volunteered his assistance, and cleverly overcame the difficulty. He knew nothing whatever of photographic manipulation, but had been in the studio several times, and was familiar with the procedure of dealing with the sitter. All that he did, therefore, was to disappear in the dark room, come out with an *empty* carrier, gravely pose the sitter, solemnly focus, and equally solemnly take off the cap after going through the orthodox formula of requesting the sitter to "look pleasant." In each case he declared the portraits to be a marvellous success, and great was the disappointment when each person who sat that day afterwards received a note from the photographer, to the effect that the negative, unfortunately, was broken, and would he or she kindly sit again.

A "young and ardent photographer" tells us a "good story," which he declares to be "well-founded." This it certainly is, for the "story" is founded upon certain notes in these columns, published more than two years ago. However, we have no desire to spoil sport further than to make this rectification, especially as it is a harmless tale enough, and destined, no doubt, simply to recal the inconvenience of travelling with silver bath and collodion in the old wet-plate days.

Here it is. Two young friends, all excitement over a prospective photographic excursion, secure a railway carriage to themselves, and pack away their apparatus as safely as they can—the camera on the cushions opposite, the tripod and tent under the seat, a small box of chemicals and the nitrate bath in a stoppered bottle in the netting overhead. Maps are consulted, a note-book brought into requisition, and some points, the results of previous excursions, examined with interest. At one of the stations a passenger enters, with tall collar, broad shirt-front, glossy hat, and blue tasseled cane, one who might have been irreverently termed a "masher," only that mashers had not been invented then. The new-comer, however, does not disturb the young photographers; it is very hot, and in a few minutes he is fast asleep, extended at full length upon the cushions of the carriage.

Presently a soft noise attracts the attention of the photographers. It is like that of rain-drops pattering on the roof. They listen; the sounds are in the carriage itself, breaking up the intervals between the long-drawn sighs of the sleeping beau. In an instant the truth is revealed; the bottle of bath has sustained a fracture, and the liquid is dropping merrily upon the starched shirt-front of their fellow-passenger. Horror! what is to be done? Shall they wake their companion, and brave the wrath of a violent swain, on his way, perhaps, to visit his lady-love? They are brave lads, the young photographers, but they do not dare this. Hastily collecting their impedimenta, they quietly steal from the carriage at the first station, leaving the gorgeous one in the blissful realms of dreamland, and to develop photographically as the sun shone on.

Every month sees photography employed more and more in book and periodical illustration. One of the most spirited pictures in the elaborate Christmas number of the Paris *Figaro*—notable, by the way, in addition, from the fact that the whole of the illustrations are in some form of "process," and in every sense are works of art—is a coloured sketch entitled, "A Gust of Wind." The effect of wind is conveyed in a singularly truthful manner—a circumstance, however, not to be wondered at, seeing that the basis of the picture was instantaneous photography. The *Graphic* has long made use of photography, and the frontispiece in the New Year's number was drawn also from an instantaneous photograph. But, perhaps, the most striking example of a photo-illustrated journal is *Scraps*, a paper which in a few weeks from its birth has attained a very large circulation. All the pictures, with but very few exceptions, are photographic reproductions, the majority from original sketches, and it may be said with truth that without photography such a paper would be impossible.

Herr Ed. Lendemann has been studying the comparative brilliancy of the stars by means of photography, and has submitted the results of his work to the Naturalists' Society of Moscow. His endeavour is to work out a method of photometry whereby the light of all heavenly bodies may be measured by photography. Our readers may remember that M. Janssen proposed to apply the photographic film to the same purpose two years ago.

Patent Intelligence.

Applications for Provisional Protection.

1898. Charles Sands and John James Hunter, both of 20, Cranbourn Street, Leicester Square, in the county of Middlesex, Manufacturers of Photographic Apparatus, for an invention for "Improvements in the construction of photographic cameras."—Dated 22nd January, 1884.

1908. Henry Rafter, Artist, 1, Kingswood Place, Dacre Park, Lee, Kent, for an invention for "Combining process with engraving for relief printing surfaces."—Dated 22nd January, 1884.

Specification Published during the Week.

2799. J. J. Sachs, "Apparatus to be used in the preparation of metal surfaces for etching, engraving, &c."
This invention relates to means for applying the sand blast.

CHAPTERS ON LANDSCAPE AND OUTDOOR PHOTOGRAPHY.

BY H. P. ROBINSON.

No. IV.—The Genesis of a Picture.

It will bring the subject of picture-making more home to the student if I take a picture that has been really done in photography, and describe its life-history from its conception to its realisation in a negative.

And, first of all, how do subjects originate? In great part this question is very difficult to answer. Many of my pictures arise before my mind's eye in a most inexplicable

manner, and remain there till I lay the ghosts by making sketches of them. I see these

"Dreams that wave before the half-shut eye."

absolutely and definitely, and can recall them when I please. They come like a dream, but do not fade away till they are done with. I often try to trace any circumstance that might have given birth to the thought contained in the visual design, but can seldom come to any satisfactory conclusion. But to go much into this part of the subject can have little of interest or use for the student. These visionary images come without rhyme or reason; the designs that will most instruct the learner will be those that come from both these proverbial causes—those, in fact, which have some tangible cause that can be traced and assigned for being born.

Most designs obtain their origin from suggestions found in nature. A picturesque bit of landscape will almost certainly suggest to the artistic eye where a figure or figures should be placed; this will lead on to the questions: What are they to do, how should they do it, and how be dressed? Then the subject ought to appear to the artist, and it will do so if he tries his best to see it; although it might be only a poor or hackneyed one, he will find that experience will improve both the quantity and quality of his ideas. It is astonishing how practice assists the imagination. That art breeds art is a well-known aphorism, and it is as true that subjects breed subjects. The picture you last produced leads up to the next, and the better you make it the better will be those that follow. The student after much practice will find himself half unconsciously storing up hints of wayside beauty and suggestive facts, and composing them in his mind into pictures, always with an eye to their possibility in photography.

In my own practice I never now feel in want of a subject. They seem to come naturally when required, but this is the result of experience rather than a natural gift, for I remember many years ago being for a whole twelvemonth without a single idea. Neither could I work one up by any means. I tried every device I could think of. I read a great deal, visited picture galleries, and tried to borrow thoughts from illustrated books, but all to no purpose; no workable idea would arise. I was fallow for about a year, and then the faculty returned, and has always been more or less present. This I put down to constant use, and I mention it for the encouragement of the young beginner, who may occasionally find that his mind is a blank. It would be almost reasonable to suppose that the more of your ideas you used up, the less you would have; but this is not the case. I know this, not from my own experience only, but from questioning many artists.

Sometimes incidents you meet with in the streets, or in country walks, will suggest subjects, not necessarily the actual incident one sees, but something that may be worked into some other scene, with perhaps many alterations. Sometimes a fine pose may be seen, or a lonely bit of light and shade; sometimes an expression or a quaint costume; and all these things should be noted for future use. No suggestive bit should be allowed to escape; all should be sketched or noted. It is good practice also to try to analyse why the pose is beautiful, or the light and shade effective. This a knowledge of the rules of light and shade and composition will enable you to do, and to do this easily, the student will find an added pleasure to his life—another feather in the wing of his artistic flight.

We will now take a picture that has been really produced by photography, and see how it was conceived and finished. To analyse and dissect a picture in a cold-blooded way, as I am going to do now, is to rob that picture of any poetry it may contain, and leave nothing but a mechanical interest; but I know no better means of conveying the information; I will therefore take one of my own—that one I have called "A Merry Tale" will be suitable for the purpose.

In the PHOTOGRAPHIC NEWS for March 29, 1883, will be found a double page reproduction of this picture by the "Ink Process." A reference to it may assist the reader in understanding what follows.

In the drawing-room of a country house in North Wales five young ladies in evening costume were amusing themselves after dinner. One of them was relating some funny circumstance to the others, who arranged themselves in a picturesque group round the story-teller. Here was the germ of the picture. A few seconds sufficed to make a sketch of the composition. The illustration is a reproduc-

tion of the jotting in my note-book, and I may remark, by the way, that the practice of making rough sketches of composition and light and shade is very useful, especially if accompanied by a few descriptive notes. It teaches the student how to observe, if it does no other good. Correct drawing is by no means necessary; the "effect" is what should be noted. To return to the picture. By an easy transition the mind easily changed the young ladies into peasant girls, and suggested suitable surroundings. A sketch was made of the arrangement, and the dress for each figure decided on. In selecting the costumes, the light and shade of the group, and its relation to the landscape, were not forgotten, neither were the accessories—the baskets, jug, and stick. The colours were taken into account only as to how they would translate into black and white.

It was arranged that the group should form part of our work for the next day; but, as often happens in the mountainous districts in Wales, man proposes, and the weather imposes: the morning opened with a deluge of rain which continued more or less for several days. Those days were not wasted, for young ladies now-a-days can not only play tennis, but some of them can shoot and throw the fly, to say nothing of ratting and ferreting! At last the storms were over, and the sun shone again, but with a great deal more wind than a photographer thinks pleasant. However, we determined that we would have some pictures, good or bad, that morning. We were getting hungry for work, and a conscientious photographer is as anxious to make a good bag as a sportsman, but a photographer's desire for picture-making is nothing to that of a set of really enthusiastic models. Mine, I know, go into the business with the greatest energy. Off we started to a quiet lane about a mile away. The photograph conveys no idea of the picturesque effect of the five girls in their humble but brilliantly coloured garments. The effects of colours under the green hedgerows and through the fields was quite beautiful. The choruses sung on the way had, perhaps, nothing to do with photography; but the foxgloves and other wild flowers the singers gathered came in very useful in the picture. Arrived at the selected spot, the camera was unpacked, and the models placed approximately in their proper places, interfering branches cut away, and everything got ready, so that the last moments might be devoted to the quite final touches, expressions, and other little things. The sun shone a cold

steelly blue, and the wind was so troublesome that we had some thoughts of giving it up after all; but we decided we had taken too much trouble to go home without spoiling, at least, one plate.

Now for the arrangement of the group. The girl to the left was sitting up at first, as will be seen in the sketch, but being a young hand at the business, she could not control herself, and, enjoying the fun, threw herself back on the bank screaming with laughter. This was a happy accident, which much improved the composition, and was seized immediately. She was at once shouted to to keep her place, which, being an easy one, required little further thought on the part of the photographer, who could now turn his attention to the other figures. The next figure, the one in the straw hat, was a steady old stager with plenty of experience and no nerves; she required but a moment's attention. The next figure, always dramatic in pose, and with a charming expression, is, perhaps, in consequence of her other good qualities, rather shakey as a sitter. She required a rest of some kind. The stick was useful here, and was of immense value in the composition. A bit of straight line to contrast a number of curves is always effective. This settled the three figures that were easiest to keep still. The standing figure being by far the most difficult position to keep,—for a standing figure without a rest often sways like a pendulum,—was left until last. The figure telling the story was now settled; the pose of the figure came easy, the model being an admirable story-teller, and thoroughly up to her business; but it was necessary to give all possible effect to the hand, for the hand if well placed would do more towards showing the intention of the picture than anything else in it. It, in a way, leads the chorus of expressions. It emphasizes the situation,—it makes you feel the girl is speaking. It was so arranged that, to make it more conspicuous, it should appear partly in sunlight and partly in shadow, and every leaf or twig that came behind it was hurridly removed. The standing figure, who could not be expected to keep the pose for above a minute or two, was placed last. The jug, basket, and foxgloves, which form the key note of the composition in the foreground, had been previously arranged, and all was ready. But a last glance from the camera showed the photographer that the tree was exactly over the head of the standing figure, and cut the composition into two parts. This would never do. But instead of moving the figure the camera was moved. This corrected the error to some extent. It would have been better to have moved it a little further, but it was feared the other tree would interfere with the story-teller. A few last words—at the special request of the models I use ficticious names—"Now, girls, let this be our best picture. Mabel, scream! Edith, a steady interest in it only for you; Flo, your happiest laugh; Mary, be sure you don't move your hand or all the good expressions will go for nothing. Bee, I will say nothing to you, but leave you to fate, Steady! Done!" and two seconds' exposure settled the matter. I scarcely expected a successful result, the thing was so difficult; but as the wind was blowing almost a gale, I did not care to try another plate. As it happened, I found when I developed the plate a fortnight afterwards, I had got a good negative. The sky was white and black; but the use of a second negative, delicate and not too obstrusively printed, soon put this matter to rights.

This seems a long story to tell; but the picture was exposed in under six minutes from the time the models took their places. This quickness is one of the secrets of success, but when your picture is to include figures it should not have the appearance of hurry, for "hurry hinders haste," and, besides, has the effect of flurrying your models: it should be the result of an perfect knowledge of what you want to do. A model should never be kept waiting longer than is absolutely necessary. It is better to give up little things rather than to lose a fine effect.

LESSONS IN OPTICS FOR PHOTOGRAPHERS.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

LESSON IX.

To find the Focus for a Narrow Pencil of Parallel Rays at a Spherical Surface.—Let D E C A be a block of glass with a spherical end of which A B C is a section, and O the centre. Let rays from G fall on it. Let us consider one

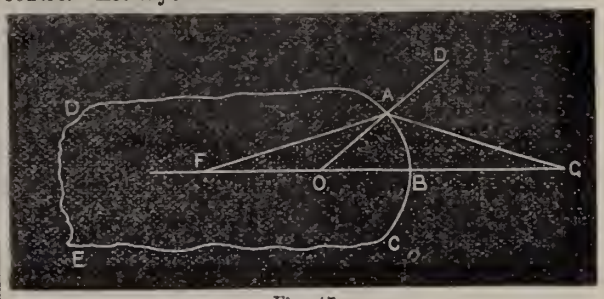


Fig. 47.

ray falling on A; join O A, and produce it to D; then D A G is the angle of incidence; let F A O be angle of refraction* (remembering that O D is perpendicular to the spherical surface); then F B will be the focal distance to find.

$$\frac{\sin DAG}{\sin AOB} = \frac{\sin OAG}{\sin AOB} = \frac{OG}{AG} \quad \text{i}$$

$$\frac{\sin AOB}{\sin FAO} = \frac{\sin FOA}{\sin FAO} = \frac{FA}{FO} \quad \text{ii}$$

But

$$\mu = \frac{\sin DAG}{\sin FAO} = \frac{\sin DAG}{\sin AOB} \times \frac{\sin AOB}{\sin FAO}$$

$$= \frac{OG}{AG} \times \frac{FA}{FO} = \frac{OG}{BG} \times \frac{FB}{FO}$$

when the triangle BQA is small. Let

$$OB = -r \quad BF = -v \quad BG = u$$

Then

$$OG = u - r$$

Then

$$\mu = \frac{u-r}{u} \times \frac{-v}{-(v-r)}$$

$$\mu \frac{v-r}{v} = \frac{u-r}{u}$$

$$(\mu - 1)\frac{1}{r} = \frac{\mu}{v} - \frac{1}{u}$$

Let $u = \infty$, then $v = f$, the principal focus for parallel rays, and

$$\frac{u}{f} = \frac{\mu - 1}{r}$$

$$\therefore \frac{u}{f} = \frac{\mu}{v} - \frac{1}{u}$$

This applies to a concave spherical surface, remembering that in such a case f is positive instead of negative. The case of convergent and divergent beams can also be considered, as we have done at the end of the next problem.

To find the Focus of a Lens.—Let Q be the source of light, $-r$ the radius of DBE, r' of D A E, P the position of focus after one refraction in the glass, F the focus after the 2nd refraction into air. Let

$$BQ = u, \quad AP = v', \text{ and } AF = v$$

From the formula of the previous problem—

$$\frac{\mu - 1}{r} = \frac{\mu}{v'} - \frac{1}{u} \quad \text{(i)}$$

Now suppose the rays to start from F, then it is manifest

* If A B C is concave, or if G is situated nearer to B than the distance of the principal focus, it will be found that the refracted ray would not cut the axis on the left hand side of B, in which case it would have to be produced to cut the right-hand side. The proof would remain the same in every case.

that the focus, after one refraction with glass, must be at P, which is a virtual focus, since it is on the same side of lens as F.

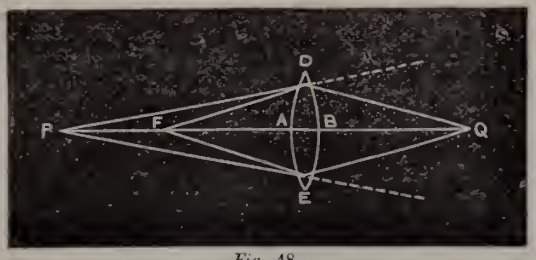


Fig. 48.

Hence, in this case, A Q must be negative. Applying the same formula to again find P, we get—

$$\frac{\mu-1}{r_1}=\frac{\mu}{AP}+\frac{1}{AF}$$

when the thickness of the lens is small, $AP=BP=v^1$.

$$\frac{\mu-1}{r^1}=\frac{\mu}{v^1}+\frac{1}{AF} \quad \text{(ii)}$$

Subtracting (i) from (ii) we get—

$$\frac{1}{AF}=\frac{1}{v}=(\mu-1)\left(\frac{1}{r}-\frac{1}{r^1}\right)+\frac{1}{u}$$

Now let μ be ∞, then $\frac{1}{u}=0$, and v becomes f, the focus for parallel rays, *i e* the principal focus.

$$\frac{1}{f}=(\mu-1)\left(\frac{1}{r}-\frac{1}{r^1}\right)$$

$$\therefore \frac{1}{v}=\frac{1}{f}+\frac{1}{u}$$

A discussion of the last equation will show the following inference.

Convex Lens.—Remembering that u is on the opposite side of the lens to f, v is negative so long as u is greater than $-f$, when $u=f$, then v is infinite. When u is less than $-f$, v becomes positive, showing that the rays proceed from a point nearer to the lens than the principal focus after refraction, are divergent, and that they have only a virtual focus on the same side of the lens as u.

Concave lens.—Remembering that f lies *on the same side* of the leus as the incident beam, and is always positive, it is manifest that as long as $\frac{1}{u}$ is positive, $\frac{1}{v}$ will always be positive—that is, a divergent beam always, on refraction, diverges, having a virtual focus. If u be negative (that is, a convergent beam converging to a point on the opposite side of the lens), v will positive till $f=u$, when it will become negative, and there will be a real, and not a virtual focus. This is often the case when a converging beam from a convex lens falls on a concave lens.

Example.—It is required to achromatize for the indigo and orange rays an equi-convex crown glass lens, whose curves have a 12 inch radius, by a flint glass in contact with it; one curve of the latter to be also of 12 inch radius.

From the table we find—

$$\mu_1=1{\cdot}542\ a=1{\cdot}542-1{\cdot}529={\cdot}013$$
$$\text{and } \mu_2=1{\cdot}660\ b=1{\cdot}660-1{\cdot}635={\cdot}025$$

The focus f of the crown glass, is found by the formula—

$$\frac{1}{f_1}=(\mu_1-1\left(\frac{1}{r_1}-\frac{1}{r}\right. \quad \ldots\ldots(A)$$

Here—

$$r^1=-12 \text{ and } r=12$$

$$\therefore -\frac{1}{f_1}={\cdot}542\times\frac{1}{6}=\frac{1}{11{\cdot}7} \text{ inches.}$$

$$f_1=-11{\cdot}7 \text{ inches.}$$

Now using the formula—

$$\frac{a}{\mu_1-1}\cdot\frac{1}{f_1}+\frac{b}{\mu_2-1}\cdot\frac{1}{f_2}=0. \quad \ldots(B)$$

we have—

$$\frac{{\cdot}013}{{\cdot}542}\times 11{\cdot}7=\frac{{\cdot}025}{{\cdot}660}\times\frac{1}{f_2}$$

$$f_2=20{\cdot}32 \text{ inches.}$$

Again, from formula (A) we have

$$\frac{1}{20{\cdot}32}={\cdot}660\left(\frac{1}{11}-\frac{1}{r}\right) \quad r=114{\cdot}2 \text{ inches.}$$

We therefore have a combinatiou; the radii of the crown glass surfaces are —12 and +12 in, the radii of the flint glass—12 and +114·2 inches. By the formula—

$$\frac{1}{F}=\frac{1}{f_1}+\frac{1}{f_2}$$

the focus of the combiuation is—27·6 inches.

Correspondence.

PERSPECTIVE.

DEAR SIR,—A note to the interesting article in your issue of January 18th, "A Study in Light and Shadow," remarks that however much a painter ought to practise the correct drawing of detail, yet "the photograph is most to be relied on for truth in all *except perspective.*" In this exception truth and error seem to me so mingled—the truth, no doubt, present to the writer's mind, while error will, I fear, be the meaning misapprehended by many—that, if you will kindly permit me, I will venture a few words on the subject.

I will begin by an illustrative experience. One interior I took last summer I felt proud of. The technical difficulty was great, the necessary angle of view enormous. A plate 18 by 15 inches was covered by a lens I had put together of little more than nine inches equivalent focus. Distortion, in the ordinary sense. was fully corrected, all vertical lines being parallel, and—for it is remarkable how few of the faults supposed inseparable from extreme wide angles are really inherent, and how many may be evaded in selecting the best point of view, both as to vertical and horizontal position—the artistic effect has not wanted for admirers. Nevertheless, my assistant heard one admirer of it, as it stood in my window, answered by his friend's remark: "But it's all wrong, you know." To such a critic it is in vain to point out that the perspective *from the point of view selected* cannot err, cannot be really wrong. Nor is it quite conclusive to recommend him carefully to shut one eye, to place the other near the middle of the picture at the proper distance, and observe how perfectly every detail falls into its natural position. He wants a picture to hang on his wall. He has seen an etching or a sketch which pleased him, and, though confessedly coarse and inaccurate in detail as compared with the photograph, it certainly needs no painful adjustment of the eye, but is seen comfortably at any distance. Of course, a man has good right to choose and please himself. But the question is, which is right, and which wrong—the photograph or the sketch? The critic in question is quite sure it is the photograph which is "all wrong, you know." Unfortunately, the inartistic abuse of short-focus lenses too often originates and strengthens this conclusion, for few there be who know how the judicious draughtsman must modify the true perspective that he may produce a result more pleasing, and more like what the brain apprehends through the naturally moving eye, than is the truly representing, but falsely seeming, photograph. But is it fair to the photographer, or to his art, to say just this? Each must work with his tools, and both painter and photographer have noble tools to work with. Let, however, the inimitable perfection of natural vision be better recognized. We see a landscape or an interior, not by simultaneously combining direct vision straight before us with oblique vision all round, but by perpetually turn-

ing our eyes in all directions, and perceiving, as a simultaneous whole, that which is actually viewed directly in successive parts. That he may better represent this effect, the draughtsman so applies his rules as to substitute for the true perspective, from the best *attainable* point, a false one, but which would be true from one, desirable perhaps, but *unattainable*.

I have not touched on aërial perspective. That, to photographers, is, of course, a matter of lighting, of exposure, and of printing. It is our art and our glory, of photography by the shortcomings of its professors, and only thoughtless critics will really judge the capabilities whether they be want of atmosphere, or an ugly point of view. Perspective is one of many points on which photographers and painters may mutually learn the one from the other.—I am, dear sir, yours truly,

W. H. Wheeler.

SOME DEVELOPERS FOR GELATINO-BROMIDE TRANSPARENCIES.

Sir,—The following developers will, I think, be found to give very good results when used with slow plates:—

Ferrous Oxalate.—To each ounce of saturated solution of ferrous sulphate add 20 grains of tartaric acid, and call them "normal ferrous sulphate," and mark it "A" solution. Make up a saturated solution of neutral oxalate of potash, and mark it "B."

Developer No. 1.—This has been recently published, but is repeated here to complete the series. To 6½ drachms of "B" add 1½ drachms of "A," and to the mixed developer, which we will call "C," add 1 to 3 drops of a saturated solution of mercury bichloride. Fully expose and develop. This gives a very rich black tone.

No. 2.—To 1 ounce of developer, "C," add 1 drop of Newton's accelerator (*so-called* "iodo-chloride of mercury"). Colour much as last, but rather deeper.

No. 3.—To 1 ounce of "C" add 3 drachms of a ten per cent. solution of ammonium chloride. This gives a very warm, rich, engraving black tone.

No. 4.—I give this as a key to the action of the others, but do not recommend it in practice, for obvious reasons. Expose fully. Immerse the plate in $\frac{1}{10}$ diluted hydrochloric acid for half a minute, well wash, and develop in developer "C." Colour much the same as in Nos. 1 to 3, but not so intense.

Memo.—Uranium chloride has not as yet given concurrent results in my hands.

Pyrogallol.—3 grains pyrogallol to the ounce of water. 1 ounce of a ten per cent. solution of soda carbonate. Developer "D."

Developer No. 5.—To the 2 ounces of "D" add 3 drachms of a ten per cent. solution of ammonium chloride, or follow the procedure of No. 4. Colour a greenish black tone, which comes out well on the screen, and is considered very good by some who have seen it. I don't like it.

Memo.—The green colour given to negatives developed by Newton's accelerator is probably *not* sub-iodide of mercury, but is due to some pyrogallol derivative, of which more some time.*

Hydrokinone.—A wide range of colour can be obtained with this developer. I confine myself to formulæ which I have sufficiently tested.

No. 6.—Hydrokinone dissolved in alcohol 1 grain to the drachm, and used in the proportion of 1 drachm to 7 drachms of water. Call this "A A." To 1 ounce of "A A" add 1 ounce of a ten per cent. solution of carbonate of soda. The objection to this developer, that it is liable to stain the film a persistent brownish yellow, may be overcome by allowing a full exposure, and stopping development the moment the last details are out, *well* washing the plate before fixing, and taking care that the hypo remains uncoloured. There is hydrokinone *and* hydrokinone in the market. The pure article only should be used.* Colour:—a warm brownish black. The addition of ½ of a grain of sodium sulphite to each ounce of developer warms the tone a little, and allows of longer exposure in the case of a thin negative.

No. 7.—Take of "A A" one ounce, and an ounce of a ten per cent. solution of ammonium carbonate. Allow an exposure of about three times what is necessary in the case of normal ferrous oxalate. Development is very slow, and some practice is required before one can exactly hit the moment when development should be stopped. By transmitted light the transpareucy has a very rich, warm, brown colour, which is very fine on the screen. The silver deposit is very fine grained, and the plate, when viewed by reflected light, looks yellow and very unpromising of good. On the screen, however, it is hardly distinguishable from a first-class well-toned collodion one.

No. 8.—Take one ounce of "A A," ½ ounce sodium carbonate, ½ ounce ammonium carbonate solutions as given above. Development is quicker, colour darker.

No. 9.—Take 1 ounce of "A A." 1 ounce of the 10 per cent. sodium carbonate solution, 3 drachms of ten per cent. ammonium chloride solution. Development is moderately quick, colour a very good warm brown, which is susceptible of a good deal of variatiou by adding more or less of the ammonium chloride to the sodium carbonate.

No. 10.—Take 1 ounce of "A A," 1 ounce of the sodium carbonate solution, to which has been added 3 to 5 grains of citrate of potash. This is perhaps the best of the hydrokinone developers, except that the colour is not so warm as Nos. 7 and 8.

All of the above give very satisfactory results with clear glass where clear glass ought to be. If a clearing solution be required, either dilute sulphuric or hydrochloric acid in alum water may be used, but with care none will be required.

H. Pocklington.

PACKING PLATES.

Sir,—As I see that the question of packing plates is again in your columns, will you allow me to suggest to your readers a plan I have lately adopted. It is at once so simple and efficacious, that, once tried, I venture to think nothing further will be required. It is, in fact, so very simple, that I cannot help thinking it must be in use. At the same time, I have never seen it, or heard it mentioned.

My plan consists merely in clipping an india-rubber band on one or both ends of the plate (an ordinary band as sold in the sixpenny boxes), and placing another on it, film to film. They can then be dropped back into the boxes, or two or more pairs put together and a stouter rubber band placed round them all, which will keep them quite tight. In either case, there is no fear of scratching, as the films are kept perfectly apart. It might be thought that the bands would cut; but I do not find this to be the case unless the very small ones are used.—Yours truly,

C. Pilkington.

LIGHT FOR THE DEVELOPING ROOM.

Sir,—In his letter to you last week Mr. Fry says:—"It is erroneous to suppose ruby or red injures the eyes; on the contrary, the optic nerves have an almost entire rest on them. Nor is it true that the focus of vision is changed. What really injures the eyes is the everlasting reading, writing, smoking, and glare of gaslight on white paper."

My experience differs from that of Mr. Fry. So long as I used cherry medium, I was obliged to wear glasses in the developing room, and if I worked more than a short time, I could not read without discomfort until a long period after I left the room.

* I have satisfied myself that the halogen, and not the base, is the active element in that accelerator.

* That which I have purchased from Reynolds and Branson, Leeds, gives very satisfactory results.

During my recent visit to Scotland, I took so many views that I asked my son to help me in the evening, but after a week's developing he was obliged to desist, as he found considerable injury to his eyes from the red medium.

My son more often uses candles and oils than gas, and his smoking propensities are limited to a few cigarettes a week. I am a non-smoker, and my eyes have not been injured by gas.

Since I have adopted the green and yellow glass, as recommended by Mr. Debenham, I can work in the developing room for many hours, and can read with comfort immediately after leaving it. Moreover, I do not now require my glasses. With reference to the safety of the light, I can only say that I have developed many hundreds of plates by it, and have never had the smallest injury arise from it.

Further, on one occasion, I considerably under-exposed a very rapid plate, and continued the development for a long period, and still no injury was done.—Your obedient servant,

HENRY HARBEN.

EXPANSION OF ALBUMENIZED PAPER.

DEAR SIR,—Here is something of a puzzle. The two prints I send you are from the same negative, and, now they are dry, measure the same exactly. If you soak them in water for an hour, and compare them while damp, you will find that the one will stretch long ways, and the other will get wider. If either of these were mounted it would "stay put," and if a portrait, the face would be either too long or too broad. This is a frequent cause of re-sittings. The expansion is generally supposed to be caused by the direction in which the print is pasted in mounting, but here you will see it occurs before mounting. Prints can now be printed to stretch either way.—Faithfully yours,

PRINTER.

OUT-DOOR PHOTOGRAPHY, ETC.

DEAR SIR,—In your "Notes" a week or two back you mention that it is forbidden to sketch or photograph Battle Abbey.

The same prohibition seems to extend to his Grace of Cleveland's northern seat—Raby Castle. Accompanying this is the result of a shot at the castle from a little distance. The lines seem all at sixes and sevens, but I believe they are not straight in the original. On reaching the Castle gate, camera in hand, the hall porter informed me that no one but a Barnard Castle photographer was allowed to "take" the Castle. However, on my assurance that I was only doing it for my own pleasure, he mollified, and I was preparing to try the old gateway with portcullis still hanging, when a smart shower put an end to my operations.

Is it not time you gave a leader on the smallest useful photographic outfit—a criticism, say, of Stebbing's camera, and the Academy, with specimens of work done by them?

What do you consider the most "put-out-of-sightable" camera stand? A small camera might sometimes be a pleasant companion on a Sunday, but few people would care to be seen carrying a tell-tale tripod. Could one put that mahogany one of Shew's that you saw at Pall Mall, up one's sleeve or into a tail-coat pocket?

Another subject—the ferrous oxalate developer—whether to use it weak or strong, how to judge when the negative is dense enough, and at what period you may hold it up to the gas.—Yours faithfully,

W. S. FOTHERGILL.

NOTE ON PHOTOMETRY.

SIR,—I feel that I must write and thank you for permitting my correspondence to take up your valuable space, although I fear that, owing to the way it has been inserted—viz., by combining under one heading the two separate communications upon two distinct subjects—the readers of your estimable paper will have some difficulty in comprehending it. The latter part of my letter as inserted, referred to the method of photometry devised by Dr. H. Hammert, which was noticed by you and published under "Talk in the Studio," in your issue of January 4th, 1884. This is of importance to me, as I hope to claim priority for that method.—I am, sir, yours truly,

JAMES B. SPURGE.

THE DECAY OF ENGRAVING.

SIR,—We see that you have taken note of our letter to the juries respecting the decay of engraving, and by implication take the side of the contraveners of the law.

Of this we do not complain, but you have misconstrued a sentence in our letter which we should be glad if you would rectify.

The six engravings to which we referred as published by us were merely half-a-dozen *out of a very large number*, which we selected as being those on which we had paid for copyright and engraving a specially large price.

There is hardly an engraver or etcher of note who has not been during the period named working for us.—We remain, yoursobediently,

MARCUS B. HUISH.

LIGHT FOR THE DARK-ROOM.

SIR,—This subject having been brought forward by yourself and correspondents, I should like to make a few remarks thereon.

Doubtless we are all somewhat apt to generalize from insufficient data, which accounts for the varying results obtained by different experimentalists.

The safeness of any medium for filtering the light depends partly on the strength of the light falling on it, the sensitiveness of the films, and distance from the window at which they are developed. I have worked in a room lit by borrowed light from the studio, and found the illumination very unequal, the shifting of a blind, curtain, or background being sufficient to darken the room considerably.

I have also worked (and am again doing so) in a room with a southern aspect, with the consequence that when the sun is out one is nearly blinded, while on a dull day it is a case of developing by feeling rather than sight.

The light is filtered through the thickness of the cherry fabric so much praised by Mr. Fry. My room being narrow from back to front, I have to hold the negative about eighteen inches from the window, and I should be sorry indeed to trust to that protection for the summer, to say nothing of the distressing glare on the eyes. Ruby and red, I take it, differ simply in degree, not in kind. As to the injurious effect of red light on the eyesight, when doctors differ, who shall decide? Mr. Fry says red has no bad effect, but on the contrary *rests* the optic nerves, and does not change the focus of vision. As far as the restful feeling goes, I can't speak very highly of its soothing effect on my "optics;" and how comes it that Mr. Ackland, at the last meeting of the Parent Society, said that working in a red light produced weakness of the ciliary muscle, and that Dr. G. A. Herschell, in a recent paper published by him, says that it *does* tend to alter the focus of the eye, and its power of accommodation for distance through the pupil being continually dilated, while in extreme cases there is danger of colour-blindness setting in?

Mr. Fry is right in his remarks about reading and writing continually with the glare of gaslight on white paper near the eyes—all the more reason for taking the greater care not to tax them unduly during the day.

Cherry fabric is a great advance on the very deep ruby which some have been accustomed to use, but I think everyone who has seen this side by side with the chrome-yellow paper and green glass, as shown by Mr. Debenham, would give the preference to the latter, on the ground of colour and quantity of light transmitted.

Mr. Fry also seems to agree with Mr. Debenham about the yellow, although rejecting the green; but on comparing canary medium with the green glass and chrome yellow paper in front of a light the other day, the mottled appearance of the canary-medium seemed to be a great drawback to its use, while the green glass, along with the other paper, gave a tint which might certainly, in comparison with red, be really entitled to be called restful to the eye. As to the efficieney of the compound, Mr. A. Cowan's experiment leaves no room for doubt.

A Wratten's plate exposed for fifteen minutes close to it, without showing any fog when developed and fixed, is pretty good evidence as to its value for dark-room illumination, though "ordinary people" would not hold their negatives so close in the ordinary way.

I am altering my window so as to have plain white glass outside for admitting white light when not developing; this framework is made to open so as to let in a little fresh air when required. In front of this will be sliding frames glazed with cathedral green glass (the darker shade in this case because of the southern outlook), and over this three or four thicknesses of chrome yellow paper, to be obtained, I believe, at Richards's in St. Martin's Lane. A movable curtain in front of the window will enable me to reduce the quantity of light when the sun shines brightly. In the space between the two windows I shall make arrangement for using artificial light when necessary — either gas, petroleum, or spirit lamp and salt as recommended by Mr. Ashman. It is to be hoped that as new developing rooms are constructed, more attention will be paid to the fact that the successful working of the gelatine process requires elbow room, ventilation, and easy control of the illumination.—I am, sir, yours truly,

CATHEDRAL GREEN.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE first Popular Evening was held in Queen Street Hall, on Wednesday evening, 23rd January.

The exhibition consisted of about 150 pictures, selected from works produced by the members during the past year. Many were of a high order of merit, and the very large audience frequently showed its appreciation by applauding the views, which were exhibited by the aid of Mr. McKean's holder.

The contributors were—Messrs. R. Murray, C.E., William Mitchell, F. Briglmen, A. Matheson, R. Irving, Jas. Crighton, W. Neilson, M. Wane, Fraser, Notman, A. B. Stewart, F. Moffat, Bashford, Crooke, Macdonald, McKean, M. Scott, H. Watson, and S. Tamkin.

The transparencies were produced by "coffee" plates, collodio-chloride, gelatino-chloride, bromide, and by the wet process, and most pleasing effects were also produced by different toning agents. Messrs. Turnbull and McKean manipulated the lantern, and Mr. Bashford occupied the platform.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 24th ult., Mr. W. COLES in the chair.

Mr. A. COWAN, referring to recent attempts to improve dark-room illumination, had obtained a very safe light by reflecting the light from a gas jet on to yellow paper, thence through three thicknesses of yellow paper and one of green glass. A plate exposed in sections up to fifteen minutes was not affected, and another plate, one-half of which was exposed ten minutes, and then both halves exposed in the camera, the exposed half could not be distinguished from the other.

Mr. W. E. DEBENHAM: Is there as much light as with the ordinary ruby?

Mr. COWAN: Yes, there is more; the advantage gained by reflecting enables a greater space to be evenly illuminated.

Mr. W. M. ASHMAN showed three plates exposed five minutes each under a transparency, twelve inches from an oil lamp, glazed with:—No. 1, ruby glass and orange paper, oiled; No. 2, yellow glass and ground glass, as recommended in the NEWS; No. 3, yellow paper on each side of greenish window glass. After developing twenty minutes, and fixing, no image was obtained. Three more plates were exposed to an ordinary spirit lamp, containing salt, for the space of five minutes, and developed twenty minutes. No. 1, twelve inches from the naked flame, resulted in a very much under-exposed negative. No. 2, eighteen inches from the flame, ground glass screen interposed, very weak image. No. 3, same distance as No. 2, opal glass interposed, image barely perceptible. When ruby glass is interposed, the sodium flame destroys the red colour. Mr. Ashman said no one would think of exposing a plate as many seconds as he had minutes, and he thought the experiments were sufficient to recommend the spirit lamp to travellers.

Mr. J. B. B. WELLINGTON exhibited several lantern slides produced on gelatine bromide plates. At the request of several members, Mr. Wellington gave the formulæ, as follows:—

	A	
Nitrate of silver ...	... ...	... 50 grains
Gelatine	... ...	.. 20 ,,
Water	... ...	... 5 ounces
	B	
Potassium bromide	.. ...	... 40 grains
Gelatine bromide ..	... ...	... 20 ,,
Water	... ...	.. 5 ounces

Convert the silver nitrate into silver citrate by means of citrate of ammonia, re-dissolving with ammonia. Mix A and B at 150° F., allow to cool, then thoroughly wash. The plates handed round, which were very fine, and of different tones, were all developed with ferrous oxalate 1 to 3, with the addition of bromide of potassium, varying from 20 to 80 grains per ounce of developer, according to the colour desired; black tones would not require any bromide. The exposures ranged from thirty seconds to six minutes, six inches distant from a fish-tail burner. Mr. Wellington noticed, when using citrate of potash, to form citrate of silver, and raising the temperature to 150° F., the blue stage was reached in ten minutes; whereas with ammonium citrate, two hours' boiling would not do it.

Mr. G. H. GARRET passed round slides produced on Mr. Cowan's chloride plates, developed with the No. 2 published formula, the exposure being six seconds to diffused daylight at 4 p.m.

Mr. ASHMAN had made further experiments with the sal-soda developer and mercuric iodide, and concluded that there is very little, if any, gain over the ammonia developer. The only effect gained, seemed to be a slight intensity, which could be detected in the negatives and prints passed round.

Mr. COWAN had come to the same conclusion as that arrived at by Mr. Ashman; he made several experiments, cutting down the exposure to a quarter. Varying the amount of mercuric iodide, and the time of its action, he did not consider it an accelerator; its action appeared to slightly intensify the plate, which could be done by other means quite as well.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The next ordinary monthly meeting will be held at the House of the Society of Arts, John Street, Adelphi, on Thursday evening, February 7th, at eight o'clock, when the subject will be, "Willesden Paper and Canvas, and some of their uses in connection with Photography." The following from the question-box will also be discussed: "Are pictures upon 'ready-sensitized' paper likely to be more or less permanent than those upon paper freshly-prepared?"

CELLULOID DEVELOPING DISHES.—Mr. Hart sends us some charming little dishes made of this strong, light, ivory-like material, which ought to become popular in the laboratory. Their strength and lightness should adapt them admirably for travelling.

A CLEAR-VISION THERMOMETER.—The difficulty of reading the ordinary thermometer in a dim light has often been felt, and those who like to keep a thermometer hanging in the dark-room will be interested in an ingenious little instrument which is manufactured by Messrs. Watson and Sons, of Holborn. As the mercury rises, it causes the tube to overbalance, and the tube itself thus becomes the index.

"INDUSTRIAL CURIOSITIES," by Alex. A. Japp, LL.D. (T. F. Unwin).—This volume treats of several industrial matters, such as the production of leather, porcelain, needles, &c. There is also a chapter on photography, but this seems to be merely an advertisement of a Regent Street studio.

RECENT DEVELOPMENTS OF THE WOODBURYTYPE PROCESS.—On Monday last, the first of a series of three lectures on "Photo-Mechanical Printing Methods" was delivered at the Society of Arts by Mr. Bolas. Several modifications of the Woodburytype process were treated of, and Mr. Woodbury's new Stannotype was fully demonstrated. It is interesting to notice that the complete set of apparatus for the Stannotype stood on a table thirty inches wide by six feet long. Next Monday the lecture will be on "Photo-Block Methods."

THE ORIGINAL AND THE PICTURE.—At Stocktou County Court on Tuesday, Mary Ann Best, wife of Edward Best, blacksmith, South Stockton, sued William Baker, photographer, for two guineas, being the amount paid to defendant for a painted portrait of plaintiff. Seven shillings had been paid into court, and plaintiff had received one dozen cartes-de-visite, value ten shillings. Miss Baker appeared for defendant. The portrait was exhibited in court, and its striking contrast to plaintiff created considerable amusement. Miss Baker said the portrait had been executed three years since, and was exactly like what plaintiff then was. His honour pointed out a distortion iu one of the eyes, and an entire absence of colour in the portrait, plaintiff beiug a handsome buxom fresh-coloured lady. Miss Baker remarked, amidst much laughter, that women change a very great deal in the space of three years. A verdict was given for plaintiff, the price of the cartes received being deducted.—*Cumberland Mercury, January 26th.*

THE ILLUMINATING POWER OF ETHYLENE.—Dr. Percy Frankland has obtained results which may be thus briefly summarised :—(1.) That pure ethylene, when burnt at the rate of 5 cubic feet per hour from a Referee's Argand burner, emits a light of 68·5 standard candles. (2.) That the illuminating power of equal volumes of mixtures of ethylene with either hydrogen, carbonic oxide, or marsh-gas is less thau that of pure ethylene. (3.) That when the proportion of ethylene in such mixtures is above 63 per cent., the illuminating power of the mixture is but slightly affected by the nature of the dilutent. When, on the other hand, the proportion of ethylene in such mixtures is low, the illuminating power of the mixture is considerably the highest when marsh-gas is the dilutent, aud the lowest when the ethylene is mixed with carbonic oxide. (4.) That if 5 cubic feet of ethylene be uniformly consumed irrespectively of the composition of the mixture, the calculated illuminating power is in every case equal to or actually greater than that of pure ethylene until a certain degree of dilution is is attaiued. This intrinsic luminosity of ethylene remains almost constant when the latter is diluted with carbonic oxide, until the ethylene forms only 40 per cent. of the mixture, after which it rapidly diminishes to zero, when the ethylene forms only 20 per cent. of the mixture. When the ethylene is diluted with hydrogen, its intrinsic luminosity rises to 81 candles when the ethylene constitutes 30 per cent. of the mixture, after which it rapidly falls to zero when the ethylene amounts to only 10 per cent. In the case of mixtures of ethylene and marsh-gas, the intrinsic luminosity of the former is augmented with increasing rapidity as the proportion of marsh-gas rises, the intrinsic luminosity of ethylene, in a mixture containing 10 per cent. of the latter, being between 170 and 180 candles.

PHOTOGRAPHIC CLUB.—At the next meeting, on Wednesday, February 6th, the subject for discussion will be "On Portable Cameras."

To Correspondents.

*** We cannot undertake to return rejected communications.

FRANK JOLLY.—1. Please read our two articles on the subject again; the last one gives you all the information you require. No yellow fabric, except the well-known tammy, is alluded to. 2. If you will make the description brief, we could find room for it in an early number, and would be much obliged to you for it.

L. L.—1. Yes. 2. To neutralize the acidity. The other points are too many and too complex to answer in this column. Shall we come and stop a week with you?

C. H.—You do not say whether the spots are noticeable as soon as the prints are made, or whether they only appear after the lapse of some considerable time. In any case, we should advise you to change the paper as an experiment. Do not, however, conclude that any sample of paper obtained from another stock-dealer is, of necessity, from a fresh source.

J. L. ROBIN.—It is not yet published, but it will probably be issued in about six weeks.

J. PARKER.—Full details will be found in a series of articles which appeared in our volume for 1881; the first of the series began on page 433. The YEAR-BOOK for 1882 also contains particulars (p. 168).

B. F. T.—One of the best direct copying methods is that described on page 689 of our last volume; and a suitable arrangement for accurately enlarging and reducing plans is figured on page 144 of H. Baden Pritchard's "Photography and Photographers" (published at our office).

J. H. W. B.—It was the fresh gold that put it into working order again; without this addition, we fancy you would have found it worthless.

H. B.—We will do our best to obtain information which may be useful to you, and if we are successful, we will communicate with you by post.

W. B. LOWNDES.—About one-fourth of a grain to an ounce, if it is not to be kept for a very long time. As much as two grains may be added without occasioning any mischievious re-action.

J. FOSTER.—We can trace two kinds of spots: one arising from dust settling on the plates while drying, and the other from careless filtration of the emulsion.

PHOTO.—Perhaps you use water which is uncommonly soft. Try the effect of hardening it by adding an ounce of Epsom salts to a large pailful.

T. B. B.—No doubt some kind of protection is necessary; but we do not think your scheme looks altogether practical.

W. M. DUNN.—So many of the numbers are out of print, that the remainder would be of but little value to you. You had better advertise for a second-hand copy of the volume.

A. A. B.—1. It is the subject of an existing patent, and you must take a licence. 2. The best way is to determine the strength of the solution by a volumetric method. See "A Plea for the Burette" in "Photography and Photographers."

G. FROST ALTON.—1. A symmetrical or rectilinear objective of about fifteen inches equivalent focus. 2. Yes, but you cannot hope to make a good bargain unless you possess some considerable knowledge and experience.

C. T. CHESTERMAN.—Thank you very much for your note, of which we shall gladly use certain portions.

AD. EGGIS.—Write to Mr. Medland, Optician, Borough, London.

R. C. COLSON.—The circumstance that you failed to add sufficient hydrochloric acid to redissolve the whole of the precipiate explains the matter. Most likely there was but a trace of zinc in the solution

V. HALL.—1. Your customer has used you very badly, but in the absence of a written agreement it is hardly likely that you will be able to obtain any redress. 2. It consists of sulphate of barium. 3. Yes.

The Photographic News Registry.

Employment Wanted.

Carbon Enlarger, Painter, &c.—G. Fischer, 54, Berners-st., W.
Recep. room and manage (Lady).—Rembrandt, 5, High-st., Ryde, I.W.
Retoucher, work-up black-and-white (Lady).—W. J., *Photo. News* Office.
Operator, manager.—A. E. Walker, 118, Abbeyfield-rd, Pittsmoor, Sheffield
Operator or manager.—W. D., 2, Nursery-vils, Bounds-grn, New Southgate
Assistant (Lady), tint, spot, &c.—A. G., 5, Heaton-vil., Heaton-rd., S.E.
Collotype Printer, expe.—E. Birch, 3, Alpha-ter., Boston-rd., Hanwell.
Operator and Retoucher, or to manage.—Operator, 18, Telford-rd., W.
Mounter, Spotter, Books (Lady).—A. E. G., *Photo. News* Office.
Opera. & Retouch, all branches.—Pyro, 1a, Prince-of-Wales-rd., Norwich.
Operator and Retoucher.—Manager, Eastover House, Bitton, near Bristol.
Assistant Operator.—A. G. R., Rosetta Cottage, Weeks, Ryde, I.W.
Retoucher & Assist. (Young Lady).—Miss J., 10, Edith-rd., Peckham, S.E.
Lady for Reception-Room, —E. D., 50, Crockherbtown, Cardiff, S. Wales.
Vignetter, good hand, first-class firm.—G. E. Lann, Market-st., Brighton.
Retoucher.—F. Piper, 56, Walford-rd., Stoke Newington, N.
Artist, for Monochrome and Water Colour.—Z. A., *Photo. News* Office.
Operator, clever at lighting, &c.—F.W., 1, Claylands-rd., Clapham-rd., S.W.
Reception Room, Young Lady of exp.—M. A. G., *Photo. News* Office.
Reception Boom, Shop, Books, &c.—W. C., 160, Arlington-rd., N.
Youth, as Assist. Op. or Printer.—L. D., Cambridge-gardens, Notting Hill.
Assistant Operator and Printer.—E. D., 576, Sunderland-st., Pimlico.

Employment Offered.

Assistant Printer, to reside in house.—W. J. Anckorn, Arbroath, N.B.
Youth, to sensitize, mount, &c.—Turner & Killick, 10, Barnsbury-pk., N.
Saleswoman and Stock-keeper, to spot, &c.—J. E. Bliss, Cambridge.
Retoucher, first-class.—W. McLeish, 71, Northgate, Darlington.
Young Lady P inter.—Gartside and Risley, *Photo. News* Office.
Retoucher, clever.—J. Hawke, George-st., Plymouth.
Dry-Plate Coaters, experienced.—Prestwich, 155, City-rd., E.
Photo-lithographer, experienced.—Photo., 150, Queen Victoria-st., E.C.
Photo. expe. largest cameras.—E. Meyerstein, 280, High Holborn, W.C.
Retoucher, for high-class work.—Mavius and Vivash, 49, Ann-st., Belfast.
Operator for N.W. Provinces, India.—India, *Photo. News* Office.
Photo. Artist, first-class, all-round hand.—W. Knight, 47, Coney-st., York.
Young Woman, charge of Painting Room.—W. Winter, Midland-rd., Derby.
Printer and Toner, young, for City.—Viaduct, *Photo. News* Office.
Retoucher, first-class.—Negretti & Zambra, Photo. Dept., Crystal Palace.
Printer & Toner (female) to manage.—Holden & Co., 42, City-rd., Bristol.
Photo-lithog., perm. if comp.—X., c/o Smith & Co., Gresham House, E.C.
Traveller, to Sell Backgrounds.—Photo., 5a, York-ter., Clapham.
Printer, skilful Vignetter.—Morgan and Kidd, Helio House, Greenwich.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1327.—*February* 8, 1884.

CONTENTS.

ZUCCATO'S METHOD FOR THE TRANSLATION OF A PHOTOGRAPH INTO LINES FOR TYPOGRAPHIC PRINTING.

THE accurate translation of the gradations of the ordinary photograph into a black-and-white grain or stipple exactly corresponding in intensity to the lights and shades of the original, is undoubtedly the main problem to be solved in making a phototype block, as, if this grained picture is once obtained, it can easily be reproduced by the ordinary method of making a photo-lithographic transfer, putting this down upon a plate of zinc or type metal, or copper, and etching into relief by well-known means. If the original grained picture is produced in transfer ink, one step in the process is obviated, as there is no necessity to re-photograph, but the grained picture is transferred directly to the metal.

In the course of Mr. Bolas' recent lecture at the Society of Arts, the various methods of translating the photograph into grain or stipple were considered at some length; but especial importance was attached to those methods in which the Woodbury relief becomes a medium or step between the negative and the grained image; methods in which mechanical rather than optical agencies step in for effecting the required translation.

Our readers are familiar with the original method of Ives, in which a surface of grained paper is pressed against a Woodbury relief that has been covered over with printing ink, and the more recent process in which a plaster cast of a relief is inked by means of an elastic stamp, having a surface crowded with minute pyramids, the inked impression being then stripped off on a collodion film; and it is not necessary to do more than allude to the excellence of the work which can be produced by Ives' method.

Mr. Zuccato has recently patented three methods for the mechanical translation of the relief into an ink picture (Nos. 4,152, 4,153, and 4,154, 1883), and these methods were described and illustrated on the occasion referred to above.

According to the first method, a plate of type metal, or similar substance of moderate hardness, is moulded or planed so that its surface is covered with a series of V-shaped ridges, closely packed together, and this plate is inked by a roller or dabber. A sheet of thin transfer paper is now laid over the inked plate, and on this is placed the relief, after which pressure is applied by the hydraulic press. Under these circumstances the inked ridges become crushed down more or less according to the relative thickness of the various parts of the relief, and the imprint of the more or less flattened ridges is transferred to the paper with remarkable clearness of outline. The impression in transfer ink thus obtained is now transferred directly to a metal plate, and this is etched, so as to leave the lines in relief. By this means a typographic block is obtained, which presents many of the characters of a wood-engraving, the lines, although varying in width, being continuous except in the extreme whites, and where they unite to form the solid blacks; but the most important feature is the circumstance that the clear, sharp boundaries of the lines serve to give the blocks most excellent printing qualities.

In other cases, Mr. Zuccato inks a piece of silk or other network, and interposes it between a zinc plate and the relief: a piece of paper being placed on the other side of the inked gauze if necessary. In this way, the stipple depends on the crushing down of the threads, and a cross-barred picture is obtained. Mr. Zuccato's third method consists in pressing the reliefs against a metal plate upon which an ink stipple has been imprinted, and the unequal spreading out of the ink determines the production of the picture.

It appears to us that the second method and the third are quite secondary in importance to the first, as they cannot be expected to give the exceptionally clear-cut lines which have been found to result when the grooved plates of type metal are used.

In connection with the subject, we would call special attention to the "Crayontype" of M. Eggis, a description of which will be found on page 789 of our last volume. M. Eggis lays a sheet of the so-called "carbon" or "manifold" paper or other inked paper on the Woodbury relief, and over this a sheet of grained transfer paper, and he now applies pressure. A stippled picture is formed on the transfer paper, and this may be transferred directly to zinc or to a lithographic stone.

PACKING AND STORING DRY PLATES.

DURING the winter months, a great many photographers, both professional and amateur, will be busy in the preparation of dry plates for use when the finer weather sets in. The mode of packing and storing these plates is, perhaps, as important a detail as any of the many processes connected with their preparation; and, probably, not a few batches, otherwise carefully prepared in every respect, have been injured by want of attention to this final stage of dry-plate manufacture.

In the first place, it is absolutely necessary that the film should be absolutely hard and dry before packing. To ascertain this fact, it is not advisable to rub the fingers over the film, for, even if perfectly clean, the finger is liable to injure the film by its pressure alone. It is a well-known fact that pressure tends to diminish sensitiveness, and thus to produce marks which are rendered plainly visible upon development. If the film appear perfectly

homogeneous and flat by reflected light, and the glass is thoroughly warm, there is little need to fear that the gelatine is not sufficiently dry.

Now comes the important point in packing—viz., the complete separation of the films from one another. Many amateurs are content to place the plates face to face, in pairs, the films being separated by small pieces of paper carelessly placed between each pair. We have even seen commercial plates packed in this manner.

Now, actual experiment performed upon plates packed with a small piece of paper placed near each end, will prove that light-coloured patches may be produced upon each plate, which not only correspond in outline with the shape of the pieces of paper, but which even reveal the ragged fibres which are usually present upon the torn edges of some of the coarser kinds of paper. Of course, in this case, the cause is evident—unequal pressure having diminished the sensitiveness at the points of contact with the paper. If the pieces of paper are carefully folded, so as to form a kind of rack, in which the edges of the plates can be inserted, this effect is of but little consequence; although, even in this case, insensitive bands often appear on the edges of the negative after development, and sometimes of sufficient breadth to diminish the value of the picture. The paper-rack, therefore, should be as narrow as possible in the grooves, and, if possible, should not exceed the breadth of the rim in the dark slide upon which the plate rests during exposure.

When travelling with dry plates, it not unfrequently happens that these pieces of paper slip out when a packet is undone for the purpose of replenishing the dark slides. For this reason, it is preferable to pack up in small batches for out-door work, having not more than four or six in a packet, according to the number of slides employed. By this plan there will be a great saving of time and trouble also; for when once a few plates are taken from a packet, the remainder no longer pack up neatly without considerable trouble, especially as the process of changing has often to be conducted in absolute darkness. Perhaps for out-door work there is no better plan than that of Mr. England. This consists in placing between the films little frames of cardboard, made just the size of the plate; but for large quantities this plan would be a little troublesome.

The method adopted by some professional makers, of separating the films with a sheet of paper, is not always to be recommended, as not only is there some danger of scratching if the films are not perfectly flat, but there is also a possibility that the pressure, being exerted uniformly over the whole film, will cause a general diminution in sensitiveness.

Coming now to the question of storage, the great enemy to be guarded against is damp, which causes fogging and staining by decomposing the gelatine film. Probably, however, either a dry room, or a cupboard near a chimney, will be available in most cases. Still a very hot cupboard is undesirable for storing plates.

Perhaps a few words will not be out of place here upon the storage of negatives. It is not an uncommon thing, for amateurs especially, who have not an endless supply of rack-boxes, to find negatives varnished and packed away with sheets of paper, perhaps newspaper, between them. In this case it generally happens that after a few months, when the negatives are unpacked again, the surface of the varnish is quite spoiled, being covered with matt blotches if the paper used was plain, and with an exact impression of the printed matter if newspaper was used. Now, although the printing qualities of such negatives might not be totally ruined, the presence of these defects, which are often plainly visible by transmitted light, cannot but injure the negative to some extent, and in the absence of rack-boxes it would probably be preferable to stand the negatives on a shelf with nothing between them whatever.

Between exposure and development, it appears that two chief evils only need be guarded against in packing, viz., scratching the film, and imperfect exclusion of light; but in no case should printed matter be allowed to touch the film, nor should two films be allowed to press upon one another; for it has been observed that if an exposed gelatine plate be pressed in contact with another unexposed plate, a second image may be developed upon the latter, the latent image having been communicated from one to the other. Although this statement perhaps requires fuller explanation and confirmation, it suggests the propriety of separating exposed films from one another with as much care as the unexposed plates.

THE SPECTROSCOPE AND ITS RELATION TO PHOTOGRAPHY.

BY C. RAY WOODS.

No. 2.—THE PARTS AND ADJUSTMENTS OF THE INSTRUMENT.

To say that the prism is the most important part of the instrument is almost superfluous. The essential properties of this part of the apparatus are as follow:—Clearness and freedom from inequalities in the structure of the glass, high dispersive power, and accurately plane and well-polished surfaces. Ordinary crown glass is not available, as it does not possess sufficient dispersive power—or, in other words, it does not widen out the spectrum to the most desirable extent. Flint glass is that generally used, and is to be obtained of different densities according to the purpose for which it is required. For photographic purposes, a clear, white quality is the best; and though this has not the dispersive powers of the densest kind, it is as well to sacrifice a little dispersion to purity of colour, the denser glass having an objectionable yellow hue in addition to a liability to tarnish.

Various other media are frequently used for spectroscopic work, such as quartz and Iceland spar, which are often required for special purposes, such as photographing the extreme ultra-violet rays.

Some liquids, such as bi-sulphide of carbon, and certain dense organic compounds, are also brought into requisition; but they are useful mainly for lecture demonstrations. Slight changes in temperature will cause such variations in density throughout a bisulphide of carbon prism, for instance, as to render it useless for fine work.

The principles of optics which give to a prism its chief value as an aid to scientific research are too well known to photographers to need more than a brief glance. When a ray of light passes at an angle from one medium to another of different density, it is refracted, or bent out of its course. A very good illustration of this—but one that is not to be found in the popular text-books—has been given in what takes place when a body of men marching across a piece of solid ground, come to a piece of boggy soil, the boundary of which is not perpendicular to their path. Those who reach the bog first find their movements impeded, and their comrades in the front rank who are still on solid ground get a little in advance. As a natural consequence, when both sides of the rank find themselves in the bog, it is found that their course has been more or less altered. The refraction or bending of a light wave in passing, say, from air to glass is similar to this: "That end of the wave which first reaches the medium will be the first retarded by it, the other portions, as they enter the glass, being retarded in succession."* If the sides of the glass are parallel, an equal amount of bending in an opposite direction takes place, and the ray passes out along a path parallel to that at which it first enters the glass. If the sides are not parallel, as in the case of a prism, yet another path is followed.

But in the passage of a ray of light composed of waves which have not all the same length, something else takes

* Tyndall on "Light."

place. The ray of white light is split up into its many constituents, that light composed of the longest waves being less bent out of its course than the light of shorter wave length. This is shown in the subjoined diagram:

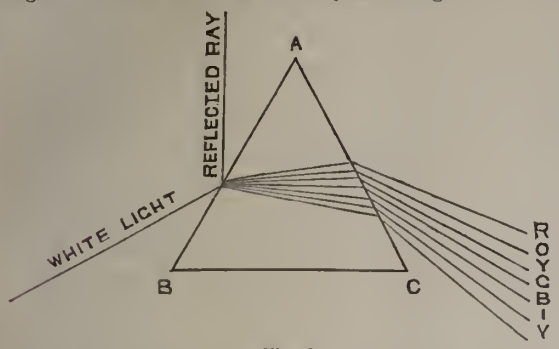


Fig. 2.

A ray of white light strikes the prism at an augle; part of it is reflected, and the remainder passes into the prism and is split up into its several constituents, these different rays being still more spread out on emerging into the air. The violet rays, on account of their shorter wave length, are most refracted, and are therefore called the most refrangible rays of the visible spectrum, the red rays, which are least bent out of their course, being called the least refrangible. Between these come those rays which produce on the retina of the eye the sensations of indigo or dark blue, blue, green, yellow, and orange. At each end of the visible spectrum are rays which are invisible to the eye, and, as will be shown in subsequent articles, have to have their presence made known by other means.

It will be convenient here to mention, incidentally, a little difficulty that the reader may meet with.

Figure 2 practically shows Newton's experiment of passing a beam of sunlight through a prism, and letting it (the light) fall upon a screen, the violet rays emerging from that part of the prism nearest the base (BC), and the red from a part nearest the apex (A). But if the reader employs his eye instead of a screen, as in the experiments detailed in the previous article, he will notice that the reverse of this seems to take place, and the red appears nearest the base. The following diagram will explain this apparent anomaly.

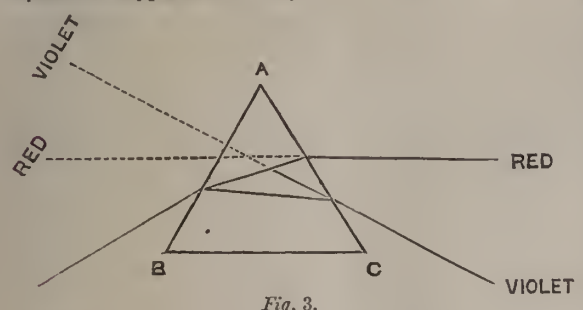


Fig. 3.

The direction of the red and violet rays is shown as in fig. 2, but the experimenter sees, not the band of colour formed by the rays as they fall upon the screen, but the slit itself, displaced and elongated into a band of colour. The dotted lines give the apparent positions of the slit as shown by the red and violet rays.

Next in importance to the prism comes the slit, for on the trueness of this piece of apparatus a great deal of the beauty of definition of a spectroscope depends. The slit plate is usually constructed of brass, the slit itself being formed by two pieces of metal, one of which is mounted in a groove, so that the slit can be opened and closed at pleasure. The edges forming the slit are ground down like a thin wedge, and these edges must be perfectly straight and smooth in addition to being parallel. In the best instruments the edges themselves are formed of a hard alloy of platinum and iridium, and their distances apart are regulated by a screw, to which is attached a circle and vernier to read off the width of the opening. It is as easy to mentally picture a perfect slit as it is to define a straight line, but the practical accomplishment of the former is almost as difficult as the latter. The slightest inequality in the slit, even that caused by a few specks of dust, will show itself. Before commencing work, it is advisable to open the slit, and clean the jaws with a piece of soft wood, such as a lucifer match cut to a point. Where great delicacy is not essential, a slit may be formed by attaching a piece of tin-foil to a piece of glass, and cutting through the tinfoil with a sharp knife or razor.

For the collimator and telescope, achromatic lenses are not essential, though desirable. Lenses of about eight to ten inches in focal length will be found most suitable for a single prism spectroscope. The slit should be placed in the focus of the collimating lens; the right place is most readily found by turning the tube, to which are attached the collimating lens and slit, towards the sun, holding a slip of paper between the jaws of the widely-opened slit, and focussing the image of the sun upon it. Absolute accuracy is not essential. The collimating lens should be large enough to fill the prism, and the lens of the camera, or the object-glass of the telescope (they both amount to the same thing), should be large enough to take in all the light coming from the prism. It is scarcely necessary to mention that the eye-piece of the telescope should possess an arrangement for focussing. The focus varies considerably for different rays, as the photographer will find, especially if he uses non-achromatic lenses, and he must use a very considerable amount of swing-back to get all the rays in focus at one and the same time. Fig. 4 is a

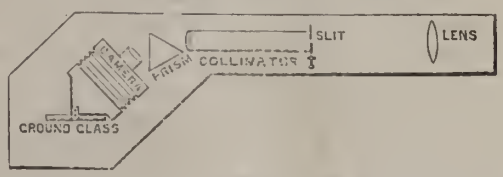


Fig. 4.

diagramatic illustration of a spectroscope used for photographing the corona in 1882, and the amount of swing-back represented there was scarcely more than was required for all the rays from ultra-violet to infra-red. The same diagram shows the relative positions of the slit, collimator, prism, and camera. In the instrument referred to, the rest of the apparatus was constructed of wood. The photographer may readily convert his camera and lens into a temporary telescope for eye observations by turning aside the ground glass, and holding his magnifier in its place.

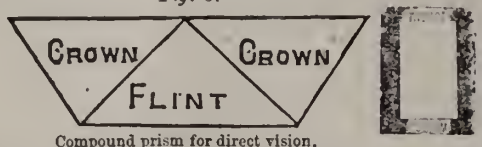
It only remains now to describe the adjustment of the prism, relative to collimator and camera. The prism, in order to get the best results, must be adjusted for what is called "minimum deviation," that is, it should be in such a position that the ray leaves the prism at the same angle at which it enters it. The following is an easy method:—

A source of light is placed near the slit, before the camera or telescope is put into position, and the observer then looks at the slit through the prism. The prism is then slowly turned round. By moving it in one direction the spectrum will move, as it were, towards that side which the violet is nearest to, till at last it moves right out of the field of vision. If the prism is then revolved in an opposite direction, the spectrum will again come into view, and appear to move more and more towards the red till it comes to a standstill; by continuing the same motion the spectrum will then move back again. At the point of rest is the proper position, when the prism will be

roughly, at the angle of minimum deviation. A glance at fig. 2 will, however, show that this angle is not the same for each ray. The photographer will, therefore, watch more particularly the blue rays, and leave his prism where those rays appear stationary. When there is more than one prism, the first one is adjusted, then the second is added, and so on, till they are all in position. It is usual, however, for spectroscopes to possess a mechanical arrangement by which all the prisms are adjusted at once. The camera may then be put in position, and the spectrum focussed on the ground glass.

A handy form of spectroscope with which the photographer is familiar, one suited for eye observations such as examining the light that passes through a particular kind of glass, is the direct vision spectroscope, the construction of the prism of which is shown below.

Fig. 5.



Compound prism for direct vision.

By the use of a combination of flint and crown glass, the rays are made to follow a straight path, whilst some of the dispersion is retained. The action is just the reverse of that of an achromatic lens, in which the colours of the spectrum are done away with, whilst the deviation is retained.

By-the-Bye.

SUCCESS IN PHOTOGRAPHY.

SOME time ago we discussed in these pages the status of the photographer, and we said that he held no recognized position in society any more than did the painter, litterateur or others of artistic calling. In short, like the author who might be Poet-Laureate or penny-a-liner, and the painter who might be a Sir Joshua or a dauber of sign-boards, the photographer simply enjoyed the position his works earned for him. There was nobody for him to lean against, and if he did not make it clear to the world that his work was good, the world held him cheap indeed.

These circumstances the photographer would do well to bear in mind. If he wishes to have name and fame in the eyes of the public, he must act precisely as do his elder brethren. "How do the painter and the author get a position?" he should ask himself, and then he might resolve to act on the same lines to win a standing for himself.

The painter paints a picture, puts his name upon it, and sends the work where it is likely to be seen and to find a purchaser. The author does the same; he writes a book with his own name, or a *nom de plume*, attached, and also takes it where he is likely to find a purchaser. If the painting and the book are good, the name attached to the good work becomes more or less famous, and there is a demand for more such works from the producer of them. Thus, the painter and the author who make good things acquire fame and fortune, while on the other hand, those whose names are attached to works of a mediocre stamp are neglected, and neither secure a standing in their profession, nor little else but bread and cheese to live upon.

Let us turn to the photographer. It is a common thing to hear a gentleman exclaim: "I never send out a picture that is not really good, and I always make a point of destroying bad prints." Now, why does he say this—why is the dictum put forward in a virtuous strain, as if the speaker had done something noble and heroic? Either it is the general way of conducting affairs, or it is not. Yet, to judge from the speech as we often hear it, it really seems that this is not the ordinary way of photographers. Of course we know very well that in very cheap studios there is not the same care taken as in others of higher class, but it is not of the former we are speaking. We here allude to those who have taken up photography as a profession, and who are disappointed if a due share of fame and money do not fall to their lot.

Photographers, we feel sure, too often forget this. They have taken some trouble to produce a brilliant card mount, emblazoned with name and address, and with all sorts of elegant outpourings in the way of promises of performance, and they too often paste upon this mount, which is to go forth to the world and trumpet out their name and whereabouts, a shabby inferior print. There are a dozen pictures to be mounted and sent off, and perhaps fourteen to select from when the batch is brought in for inspection. Six of the pictures are very good, and those you pass at once; another four are passable; and then, to make up the twelve, you select the least bad of the others. In this way you incur little waste, and as the customer is a chance one, or has ordered but a dozen cartes and nothing else, this arrangement you think will do very well. Another and better plan, no doubt, would be to have mounted only the six best, and to have printed another batch, but to do this entails further expense and further trouble; besides, ten out of the dozen photographs are very passable pictures, after all. So your beautiful mount with its glazed back and gilt edges, bearing your name in a magnificent scroll, is put at the back of a little dowdy print, and forth goes the latter into the world to proclaim what?—that you are an artist of only second-rate ability.

Follow the print you send out, be it good or bad, and see what happens to it. The purchaser has bought it and the others that make up the dozen, not for his own album, but simply for giving away. In other words, the dozen pictures you send him are, from one point of view, a dozen advertisements that go into strangers' hands. These strangers, very probably, have no knowledge of your existence as a photographer, but now they look at the back of the smart card given them, and read your name and address. What follows is but a matter of course. If it is a fine picture of friend Jones, or a charming representation of Mrs. Thomson, Mr. and Mrs. Stranger are naturally very pleased; but the strange thing about it—and this our readers should remember—is, that if the picture is a good one, neither Jones nor Mrs. Thomson get any credit; this all goes to the photographer. The latter gains much, therefore, whenever he turns out a good picture, for Mr. and Mrs. Stranger note his name at once, and if either of them want a portrait of themselves or of the dear baby, to the photographer do they go direct, whose picture has pleased them so highly. In fact, the family album, from its owner's point of view, is ofttimes regarded as a book of patterns, and he who has supplied the best pattern in the collection is likely to obtain the most custom.

The sitter himself, therefore, although you do your best to please him, is not really the person with whom you have most influence. He or she has only bought the pictures to give away, and is, in fact, acting as your advertising agent. Unfortunately, this fact is frequently lost sight of, and a photographer thinks that if by hook and crook the customer is satisfied, and pays his money, the transaction is a profitable one. It is nothing of the kind. Sitters there are—not very many, perhaps, but still in goodly number—who do not care a straw how you depict them, so long as the portraits are tolerably well executed, and they give away their photographs just as you send them. They publish your work, so to speak, for good or evil, and you may be quite sure that bad portraits work their producer incalculable harm. The Stranger family may have thought well of you before, because they heard from the Smiths how good you were with children; but since old Brown gave them that hideous portrait of his taken at your studio, they have changed their opinion, and nothing will induce them to enter your doors.

Thus, the selection of good prints, and the destruction of bad ones, is no virtue, after all; it is simply a policy that is not merely honest, but is the only one likely to bring success to the photographer who practises it. It is the policy that is practised every day by the author and by the painter who is successful; wherever your name goes—and the photographer takes care his name goes on every one of his mounts—the work in connection with it must be sterling good. Therefore, if the work is inferior, either destroy it, or do not put your name to it. Dr. J. F. Carpenter, the author of "What are the wild waves saying," and a thousand and one other popular ballads, once gave us an apt illustration of this. His usual fee, after he had become a noted song-writer, was ten guineas for every ballad, and one day, when he called at his publishers, the latter complained of this charge as being somewhat high. "We have got a young fellow just fresh from Cambridge to do some capital sonnets for us, and we only give him a guinea a-piece for them," was their statement. Replied Mr Carpenter: "Well, and I will do you some capital sonnets for a guinea a piece—as many as you like; only, you mustn't attach my name to them."

This is only fair. When you have earned a good name for good work, you must be very circumspect about using that name. Unless the work is in every way first-class, your reputation is sure to suffer. "Just make me a sketch, and put your name to it," is a frequent request made by thoughtless people to artists of standing; while Charles Dickens was frequently bothered by editors of small periodicals for a story, however slight and short, with his name at the top. No one knew better than Dickens "what's in a name," and no one was more chary of depreciating that good name by work of an inferior order than the famous novelist.

So we say that, since photographers are ever ready to put forward their name—and, indeed, make rather a parade of it—they, of all people in the world, should be careful what work is coupled to it. Every print sent out from their establishment is an advertisement of that establishment, and as they sow, so surely will they reap. While they will never lose credit for good work, they will sooner or later most assuredly suffer when bad pictures are inseparably connected with their name; whether it is mere thoughtlessness, or something worse that leads them to adopt such a course, their shortcomings must perforce recoil upon themselves.

DR. EDER'S RECENT RESEARCHES.

BY WALTER B. WOODBURY.

The properties of the ferricyanide of potassium, in combination with gelatine, discovered by Dr. Eder, and mentioned by Mr. Bolas at the first of the series of Cantor Lectures, may possibly cause a complete revolution in carbon printing, and most processes of a kindred nature, where the gelatine has to be washed away, as in the Woodburytype, Stannotype, &c. There are, doubtless, many points to be solved, such as relative sensitiveness to light—principally; although, not having had any experience with this combination, I should imagine that, if insolubility of the gelatine occurs on mixing with the ferric salt, there would at once arise a difficulty in getting either paper or glass coated with the mixture. But if it could be employed, as are now sensitive carbon or Stannotype tissue, there seems to be no difficulty in its use.

A complete reversal of all the processes would naturally occur. The carbon process would require a positive, and the Stannotype a negative to work from, thus completely changing the existing order of things. In the latter process, all that would be required would be to keep sheets of plate glass coated permanently with gelatine, and sensitize as required for use, to expose under a negative, and wash away the parts rendered soluble by light, coating, when dry, with tinfoil, as usual. No reversal of the image would take place, as the surface image from the negative would naturally be reversed, and brought right again in the print. This is a most important feature in all photo-mechanical processes, and formed in the early days of the Woodbury process a serious drawback, until by accident a relief was laid with the wrong surface in contact with the lead (turned inside out, in fact) with no apparent difference in the resulting prints. Since then this method has been adopted in all Woodbury printing, except where film or reversed negatives were handy. In what Mr. Bolas termed the first Stannotype process (although the name was only given to the later) the same difficulty appeared, all prints being reversed, which called forth the remark from a celebrated German firm that this fact took all the cream off the system. This additional reason to those given by the lecturer was the cause of its abandonment.

FRENCH CORRESPONDENCE.

Experiments with Warnerke's Phosphorescent Photometer—Action of Water and Hyposulphite of Soda on Gelatine Emulsions—Non-Stretching Pellicles—Photographic Laboratory at the Museum of Decorative Arts—Physiognomy Album—Pocket Photographic Apparatus.

M. de la Noë's Practical Experiments with Warnerke's Phosphorescent Photometer.—At the February meeting of the Photographic Society of France, Commandant de la Noë, director of the topographical brigade, gave the result of his observations on our friend Warnerke's photometer. After a series of regular observations carried on for a year, it was found to register apparently lower at noon than in the morning or evening. A table of the curves of each series of observations has been drawn up in order to arrive at the conclusion that the action of full daylight upon the retina of the eye caused it to be partially insensible to perceive the true degree of luminosity. For instance, an observer at noon notes the degree visible to him in the open daylight; he sees, perhaps, No. 14. Another observer, having previously remained in a dark place for about a quarter of an hour, on looking at the instrument, was able to see the entire series of degrees on the transparent scale. Evidently this action of light on the retina is an obstacle to the correct reading of the veritable degree. M. de la Noë wished to control these observations by means of Warnerke's sensitometer, and has arrived at the results he had foreseen—that is, to the registering of one degree higher at noon than at 8 a.m. or 4 p.m. The sensitive plate receiving the impression from the phosphorescent is not influenced in the same way as the eye, and manifests an actinic result agreeing with the intensity of light.

Action of Water and Hyposulphite of Soda on Gelatine Emulsions.—M. Audra has been pursuing with success his researches relating to gelatino-bromide. He read an interesting and instructive paper at the meeting, on the action produced on gelatine plates by ammonia, hyposulphite of soda, and water. One half of each plate was treated with the agent, while the other was left under its normal condition. He stated that a hundred thousandth part of hypo in solution was sufficient to show a marked action. A plate was half immersed for a few seconds, and washed, and the whole plunged into the ferrous oxalate, when the portion submitted to the hypo was more quickly developed. M. Audra, therefore, recommends the use of one gramme of hypo in a litre of water as an accelerator. The washing also seems desirable. The action of ammonia is similar, but less active. Water produces a marked effect. The moistened portion of the plate does not give an image so quickly at the commencement of the development, but the water, owing to the salts held in solution, tends to fog the plate. The retardation seen at first is due to the time elapsing before the ferrous oxalate can re-

place the water by acting upon the already swollen surface.

M. Bornstein's Non-Stretching Pellicle.—My last communication on the subject of pellicles has set M. Bornstein to work in the direction of finding the means of producing pellicles not subject to enlargement, and consequent rolling up, during the processes of washing, developing, and fixing. One may thus, according to need, choose pellicles stretching and enlarging themselves, or those remaining their original size.

Foundation of a Photographic Laboratory at the Museum of Decorative Arts.—This Museum is about to be endowed with a laboratory for the photographic reproduction of objects of industrial art which are there exhibited. By this means industrial workmen will be enabled to procure at low prices, through the Central Union Society of Decorative Arts, pictures of articles of furniture and jewellery, porcelain, textile draperies, hanging, &c. The fitting up of the laboratory has been entrusted to M. Davanne and myself; the excellent operator in charge of the work is M. Ferdinand Roux.

M. Chapiro's Album.—M. Constantin Chapiro, of St. Petersburg, has presented, both to our Society and the Academy of Fine Arts, copies of his magnificent album, in which are illustrations, by photography, of Nicolas Golgol's "Memoires d'un Fou." This work is remarkable from all points. It opens out a vast horizon to the application of photography. It consists of scenes in the romance in which a talented actor, M. Andreef Bourlak, throws himself into the part of the hero, and photographed by M. Chapiro. At this first trial, it is a masterstroke, and it is to be hoped that before long more complicated studies will be issued.

Completion of the Pocket Photographic Apparatus.—To return to more personal details, I showed at the meeting my pocket camera and dark-boxes. It has been met with great approval from the numerous photographers, both professional and amateur, who have examined them. The lens, having focal length of 10 millimetres, covers sharply a surface of 7 by 7 centimetres; it is a little gem by M. Français. To complete everything, there only remains the tripod stand, and that I will now describe. I have a bamboo of 25 or 30 centimetres in diameter at the top of the length of an ordinary walking-stick. The cane, split up into three portions, forms the three legs, their lower extremities having an iron spike, and clamping together when closed. In the hollow of the bamboo is another, of nearly the same length as the first, but of one centimetre in diameter. A screw is fixed at its upper end for the purpose of attaching to the camera. At the top of the larger split cane are hinged together the three segments, the slender cane passing up and down to the required height through the centre, where it is fixed by screwing up or unscrewing, loosening or tightening it. When the apparatus is closed, two rings keep the legs together, while a knob screwed on at the upper ends keeps the inner stick in its place. The camera, with double dark-box and lens, weighs only 140 grammes (just under 5 ozs.); the stand can therefore easily support it. I hope, as soon as this is completed, to send an exact drawing to the PHOTOGRAPHIC NEWS, as that will show far better the various details of the apparatus, which I call a photographic *vade mecum*. LEON VIDAL.

PHOTO-LITHOGRAPHY AND PHOTO-ZINCOGRAPHY.

BY MAJOR J. WATERHOUSE, B.S.C.,
Assistant Surveyor-General of India.

CHAPTER XVI.—NEGATIVE TRANSFER PROCESSES.

A PROCESS of this kind was introduced some years ago into the Goot Printing Office, at Sydney, N. S. W., by Mr. J. Sharkey, with considerable success.

From a description given by Mr. E. H. Docken, the details of the process are as follow:—

A sheet of albumenized paper is sponged on the plain side, and laid on a plate of glass, albumen side up. It is then evenly brushed over with a composition prepared by mixing

Starch	1 ounce
Water	1 ,,
Bichromate of potash ...	60 grains
Sugar	60 ,,

When the bichromate and sugar are dissolved, add

Gum-arabic...	2 ounces
Water	2 ,,

and filter through fine muslin.

The paper is dried in the dark, and exposed under a negative as usual.

The mode of transferring varies according as the subject is taken on one negative or several. In the first case, the exposed print is placed between damp blotting-paper till it becomes tacky. It is then placed face downwards on a lithographic stone and passed through the press. The back is then sponged with water until the paper will lift away, leaving upon the stone all the gum mixture which has not been affected by light. The stone is then thoroughly dried, and brushed over with a thin fatty ink composed of

Burgundy pitch	2 ounces
Gum mastic	4 ,,
Bee's-wax	8 ,,
Shellac	4 ,,
Brown soap	2 ,,

melted in a vessel over a slow fire, and burnt for about ten minutes in order to remove a portion of the fatty matter. It is thinned with turpentine to the consistence of collodion, and should be kept well corked.

As soon as the coating of ink is dry, it is washed off again with oil of turpentine; the stone is then sponged with gum-water, and rubbed over with an inky rag, which at once develops the design, and the stone is then ready for printing in the usual way.

If the subject has been taken on more than one negative, the exposed sheets are placed on stones coated with a thin layer of lithographic retransfer ink, to which a little gold size or other drier has been added. The same manipulation as before is gone through, but in this case the paper not only leaves its unchanged gum on the inked stone, but the insoluble lines forming the image take the ink from the stone, so that the design is on the paper in retransfer ink. The sheets are then dried, joined as required, and transferred to another stone.

The manipulation is very easy in both methods, and the stone is ready for the printer within a quarter of an hour from the exposure of the paper beneath the negative. For the second process it is better to use thin bank post paper.

In his treatise on "Photo-lithography," M. Geymet has given a very detailed and practical description of a negative process with gummed paper.

Albumenized paper, the albumenized surface of which has been coagulated with alcohol or by steaming, is floated for three or four minutes on a solution of bichromated gum, made by adding equal parts of a saturated solution of bichromate of potash and thick gum-water containing 100 parts of gum-arabic in 150 parts of water.

The solution must be carefully filtered through muslin, and be free from bubbles. The paper is then drained, and dried in the dark. It must be used fresh, or not more than one day old.

About two minutes' exposure in the shade is sufficient even in a moderate light. The impression should be visible, but scarcely marked. If the exposure is carried on till the image appears of a golden yellow it will be impossible to transfer. By the light of a candle the image should just appear of a green olive colour.

The exposed print is then placed on a sheet of wet

blotting-paper, gummed side up. A sheet of white paper is laid over the gummed paper, and when this begins to stick to the print, the latter is ready to be transferred.

The difficult part of the operation now begins, and success depends on the even damping of the print, which should just be limp and moist without being wet.

The stone should be slightly warmed before a fire or in the sun, and being adjusted to the press the paper is laid face downwards upon it, and covered with five or six sheets of ordinary paper and a sheet of soft cardboard. The tympan is then lowered, and the stone passed through the press some eight or ten times.

A wet sponge, from which the water has been squeezed out, is now passed several times over the back of the paper adhering to the stone. After five or six minutes, a corner of the print is raised gently, and the state of the transfer is examined with care. If it appears successful, the paper should be carefully pulled off the stone; if it resists, it should be sponged and tried again after a few minutes.

A good or bad transfer can be distinguished at once. When the paper is withdrawn, the image should show itself clean and sharp in a brilliant yellow on the white or grey stone.

The edges and all parts of the stone unprotected by gum are gummed, and then, when the stone is thoroughly dry, it is brushed over with retransfer ink rubbed down with turpentine.

A wet sponge is now passed over the whole, and the image appears at once, but may be grey and weak, owing to the thinness of the retransfer ink. This is of no consequence.

The stone is wiped with a damp sponge and allowed to dry, then covered with thick gum-paper, rubbed in well with the hand, and set aside to dry. After some hours the stone is washed, and then brushed over with weak acid and water. It is inked in acid treated in every way like an ordinary lithographic transfer.

In case of an accident, or of its being desired to make duplicate transfers, the original gumming transfer print may be inked by passing it through the press on a stone covered with retransfer ink. It is then washed, and can be transferred in the same way as an ordinary inked photo-transfer print.

(*To be continued*).

A Dictionary of Photography.

ALBUMENIZED PAPER (Printing on).—*Continued.*

Drying Prints.—If we desire to dry prints of large size, it is advisable to keep them as flat as possible, and thereby avoid cracks and tears. Blot off the superfluous water by means of the linen cloth previously recommended. Place two prints of the same size back to back, and suspend by two American clips in the drying-room; but not from the clips used for the sheets of sensitized paper. When they curl at the lower corners, reverse them—that is to say, turn them upside down, but still back to back; when taken down, they will be flat enough for most purposes. Prints of small size may be suspended in strings of two or three dozen, one below another like steps, and when nearly dry, they will drop off; if they are collected and placed face downward under a weight, they will become flat and remain so.

Now let us suppose that the prints are of cabinet size, to be mounted on ordinary cabinet mounts, not reduced to the required size before toning, and we have decided to cut them by means of the glass-shape and sharp knife; under these circumstances the prints must be dry, and the cutting-shape held down firmly on the print to obtain the best results. To mount them, place six, albumenized side downwards, on a clean linen cloth, pass a brush well charged with starch paste over each, separately, working from end to end, and from side to side, being careful not to get any starch underneath, or leave any lumps or extraneous pieces on the print; have ready at hand a pile of mounts, some sheets of clean paper, a paper-knife, and a damp sponge. With the paper-knife raise the first starched print from the cloth, adjust it over, but not touching the mount, until the margin appears equal along the top and two sides; now lower the top edge on the mount, and gradually the remainder. If this has been successfully accomplished, which may be seen at a glance, cover with white paper, and rub the print well down all over with the paper-knife. Should any of the mountant be squeezed out at the edges, it should be removed with the sponge. When the whole of the prints have been mounted, place them, face downwards, on a clean surface in a current of air; they do not alter in shape so much this way as when left to dry face upwards. To prevent the photographs from curling inwards, Mr. C. Keuchel constructs grooved wooden slabs or strips of moulding having a section, as shown in fig. 4, each slab being a trifle over two feet in length.

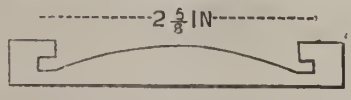


Fig. 4.

The mounts are pushed in this grooving, six, end to end, so that they become arched. After mounting, they are again slid into the grooving, and allowed to remain until dry. When the prints are nearly dry, they are in the best condition for rolling, an operation we will briefly describe, since, for large pictures, at least, the rolling-press is a necessity. The subjoined figure, as will at once be seen, represents a rolling-press, the movable bed being of polished steel, and the pressure, which is capable of acting on the print by means of the roller and steel bed, is regu-

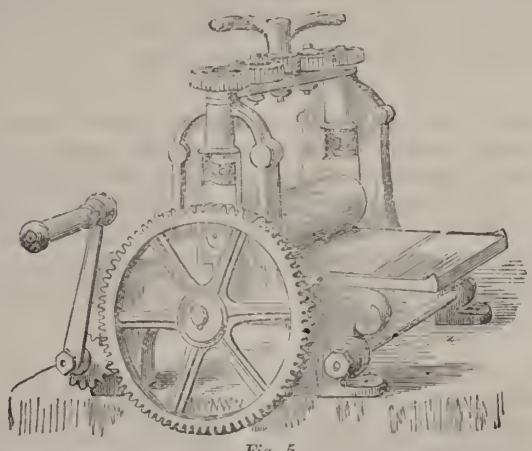


Fig. 5.

lated by the adjusting screws at the top. Brush the surface of the print—also the polished steel plate—with a camel-hair brush, or rub with an old silk handkerchief, to remove particles of dust or paper; place the print, albumen side in contact with the steel plate, and pass it through the press twice, which flattens the picture, and produces an even and polished surface. By heating the plate a more brilliant surface will result. Rolling-presses are manufactured for both cold and hot rolling, and can be procured at any of the stock houses. Where rolling is not permissible, as in the case of scrap-books, a good plan is to attach the print in the usual way to the leaf of the book, damp the back of the leaf slightly with a sponge, and set aside to dry, placing a piece of stout cardboard on each side of the leaf. A strong paste should be used, such as the following, and, when dry, the surface can be very much improved by passing a warm iron over it, substituting plate-glass for the cardboard beneath:—

Best Bermuda arrowroot, or Kingsford's Oswego corn-flour	3½ ounces
Water	28 ,,
Nelson's No. 2 gelatine ...	160 grains
Methylated spirit	2 ounces
Carbolic acid	12 drops

Mix the arrowroot and a small quantity of the water to the consistency of cream, then add the remainder of the water and the gelatine a little at a time; boil on a water bath for five minutes, stirring the whole time, and allow to cool; before quite cold, add

the spirit and carbolic acid. This mixture will keep a long time if well corked.

Another:—

Dextrine	1 ounce
Water	1 „
Methylated spirit	2 ounces

Mix the spirit and water, stir in the dry dextrine, until a smooth paste is obtained; heat on a water-bath until a clear brown solution results.

Notes.

The subject of photography in the new edition of the *Encyclopædia Britannica* will be treated by Captain Abney.

Mr. Colin Hunter, the last elected Associate of the Royal Academy, is an accomplished photographer.

According to the annual report of the Photographic Club, it now comprises seventy-three ordinary members and nine honorary members. The meetings are held at Anderton's Hotel, Fleet Street, every Wednesday evening.

By-the-bye, we see that Edinburgh has now a Photographic Club, which seems to be prospering.

A good deal of interest was felt at Mr. Bolas's lecture on Monday evening, on the subject of the velvet roller and the composition of the ink employed with it, in photo-lithographic work. For this reason we mention that Mr. Newlands, who so skilfully assisted Mr. Bolas on that occasion, furnished the recipe for the photo-lithographic transfer ink given in "The Studios of Europe," for use with the velvet roller.

Mr. W. Webster, junior, an amateur of many years' standing, has taken a landscape illuminated by the beautiful after-glow with which we have been frequently favoured during the winter. The photograph was secured early in December, after four o'clock, the camera pointing west; and there is pretty plain evidence that the sun was well below the horizon at the time. Although considerably under-exposed, the picture is, in some respects, a very good one.

Another recommendation for illuminating the dark-room. Herr Schumann writes in the *Wochenblatt* that he has for some time past abandoned the ruby screen for his lamp, using, instead, orange glass ground on one side. Lately, however, he has employed nothing but brown tissue paper, oiled. Three thicknesses of this paper are usually sufficient, supported upon a plate of ordinary window-glass.

In all these experiments, the principle of "give and take," we repeat, always plays an important rôle. Some light must be admitted, if the photographer is to see what he is doing, and naturally the problem to be solved is to admit a light that does the least amount of mischief. If it were only a question of keeping out every actinic ray, a deal board or brick wall would answer the purpose best of all. As it is, we would recommend the photographer, whether he employs orange or ruby glass, to use a ground surface as well, since the more the light is diffused, the less dangerous is it to the sensitive film. That even two thicknesses of ruby glass will admit plenty of actinic light may be proved by placing them in front of a quick-acting lens; in these circumstances we have secured a picture of a cluster of tall chimneys on a fine day with a three minutes' exposure.

We hope next week to devote a little space to tourist photography, and, if all goes well, to commence a short series of papers "On a Trip to the Great Sahara with a Camera; by a Cockney." We fear there will not be room both for our "By-the-Bye" and for the Cockney lucubrations, and in this case the latter will take the place of the former for a time.

They are still hard at it in Germany threshing out the subject of whether the King of the Belgians did or did not influence the Brussels jury in favour of Mr. Robinson. Why does not Mr. Robinson make a clean breast of it, and tell us frankly what inducement it was he held out to His Majesty? The onus certainly lies with our friend of Tunbridge Wells.

The Photographic Society of Silesia is not dead, we are assured, but suffering from suspended animation.

How to make gold ink. The *Chemist and Druggist* says: Take equal parts of iodide of potassium and acetate of lead; put them on a filter, and pour over them twenty times the quantity of warm distilled water. As the filtrate cools, iodide of lead separates in golden scales. This is collected when the filtrate has quite cooled, washed with cold water on a filter, and rubbed up for an ink with a little mucilage. The ink thus made must be shaken every time it is used.

Two photographic relics of some value have fallen into our hands. It may be remembered that when Nicephore Niépce came to England in 1827, he addressed the Royal Society in respect to his invention, lodging with Mr. Bauer, the secretary, a memoir of his process and a photograph fixed from nature. Mr. Bauer, it was, who subsequently, in 1839, when Niépce was dead and forgotten, reclaimed for the French inventor some of the fame Daguerre had wholly monopolised. The representations of Mr. Bauer, indeed, may be said to have secured to M. Isodore Niépce, the son, a pension of 4,000 francs from the French Government, which awarded Daguerre, on the other hand, an annuity of 6,000 francs.

When Mr. Bauer died, the memoir and the photograph in question passed into the hands of Mr. John J. Bennett, a well-known Fellow of the Royal Society. This gentleman being recently deceased, his scientific collection has been sold, and, in default of a better offer, the two relics in question have come into our possession. They will

form the subject of a critical examination, and furnish the text for a forthcoming "By-the-Bye."

Astronomical observations are attended with a good deal of personal inconvenience, and even risk. For the future, however, they may be undertaken with safety, even by persons of delicate constitution. Mr. Howard Grubb, whose name as a maker to lenses is known to every photographer, described at a recent meeting of the Physical section of the Royal Dublin Society a new form of equatorial telescope, of which all the optical and large mechanical parts were in the open air, while the eye-piece was in a room. Mr. Grubb's designs (pictures of which were shown in the lantern) represented the observer seated in an easy chair, at the side of which were handles controlling hydraulic machinery, by which all the movements of the telescope were effected. An arrangement to attain the same end has been used in France, but is much more expensive and complex than Mr. Grubb's apparatus.

The French Government has resolved to despatch a scientific mission to Java in April next, for the purpose of studying and reporting on the recent volcanic phenomena. A photographer will accompany the mission.

Messrs. Braun, of Dornach, who were the earliest workers in the carbon process, will shortly issue the first part of their series of carbon printed reproductions of the principal pictures of the Dresden Gallery.

Photography is not, it seems, the only process capable of taking an instantaneous portrait. The silk weavers of Lyons, it seems, are able to run it very hard. At the establishment of M. Carquillat, just deceased (who is described as the most remarkable silk weaver Lyons has produced), it was customary, when it was desired to compliment a distinguished visitor, to conduct the latter to the atelier connected with the establishment, and "at a moment's notice" weave a portrait of him in silk. These portraits had acquired quite a European reputation —at least so says the *Echo*.

The discolouration of paper is frequently a source of worry to the photographer. Brownness and yellowness that come simply from the natural action of light upon the paper pulp are oft-times attributed in a photographic print to some chemical reaction, and the photographer is held responsible for the sin. In fact, it is not so long ago that an outcry was raised that carbon prints fade, and it was not until very satisfactory proof was forthcoming that the transfer paper, and not the image, was at fault, that sceptics were prevailed upon to give up the idea.

There are several reasons why paper yellows in time, and, as everybody knows, all ancient pages show the defect more or less acutely. But modern papers discolour yet more quickly than those formerly manufactured, and one reason for this is that many of them contain a good deal of woody fibre. Wood browns in contact with the air comparatively soon, and then there is the disadvantage that the appearance of the paper is spoilt, and it is less durable. In fine papers, such as the photographer uses, there should be no woody fibre at all, or, at any rate, very little, and this is why it is useful to have the means at hand for detecting the presence of wood. The *Chronique Industrielle* gives a very simple test for the purpose, which is, to moisten the paper with a mixture of one part sulphuric and three parts nitric acid; a yellow colour at once results if the paper contains wood, the depth of colour indicating the proportion that is present.

Messrs. Brown, Barnes, and Bell are sending round specimen prints to publishers and proprietors of newspapers, and the qualities their process may possess for book illustration will therefore be practically tested. The weak point of the specimens was, however, at once "spotted" by a shrewd publisher who has had a long experience of illustrated journals. "Yes," he said, "they are very nice, but when the inventors claim that their process will stand the wear and tear of newspaper machinery, and may be printed on rough paper, one ought to see specimens so produced. These samples, printed with care and on first-rate paper with a highly glazed surface, tell me nothing of what the process can do under other circumstances." There is some force in the objection.

Bold indeed could be the sculptor who would venture to set aside old ideas, and represent the horse in action, as Mr. Muybridge's camera depicted him. Indeed, some of the true attitudes are so completely unlike those of the conventional representations, that *Funny Folks* gives sketches after Muybridge, as burlesque suggestions for the new equestrian statues to be erected on Blackfriars Bridge.

Patent Intelligence.

Application for Provisional Protection.

2312. Alfred George Brookes, of 55, Chancery Lane, in the county of Middlesex, Fellow of the Institute of Patent Agents, for an invention for "Improvements in the method and apparatus to be employed in the preparation of surfaces for printing or etching by the aid of photography."—A communication to him from abroad by Edward Kunkler, of St. Gall, in the republic of Switzerland, Civil Engineer, and Jacques Brunner, of Kussnacht, in the canton of Zurich, in the aforesaid republic, Photographer and Art Printer.—Dated 29th January, 1884.

Notice to Proceed.

4705. Richard Brown and Robert William Barnes and Joseph Bell, all of Liverpool, in the county of Lancaster, for an invention of "Improvements in and relating to the art of obtaining by photography definite photographs to be used in the production of typographic blocks and in the art of photo-lithography and like arts."—Dated 3rd October, 1883.

Patents Granted in America.

292,181. Proctor R. Shugg and George Boyle, New York, N. Y. "Process for making relief printing plates or blocks." Filed March 19, 1883. (No specimens.)

Claim—1. The sensitive plate composed of gelatine, albumen, glycerine, resin, and bichromate of ammonia, substantially as set forth.

2. The method herein specified of hardening relief gelatine plates, consisting in treatment of such gelatine plates successively to baths of solutions of bichromate of ammonia, nitrate of silver, sulphate of iron, and ammonium hydrosulphite, substantially as set forth.

CHAPTERS ON LANDSCAPE AND OUTDOOR PHOTOGRAPHY.

BY H. P. ROBINSON.

No. V.—SUBJECTS. THE ORIGIN OF IDEAS.

No writer on art, as far as I am aware, has ever ventured to say anything on the subject of the conception or origin of subjects for pictures or other works of art. Ruskin, it is true, in his seldom-read second volume of "Modern Painters," treats of the Imaginative Faculty, but in this he soars far above the head of the ordinary reader. The origin of ideas is, perhaps, a metaphysical rather than an artistic matter, and should be left to the writers on what is called "pure reason;" but there is, perhaps, a word or two to be said on the subject that may be appropriate here.

In the last chapter I showed how a certain picture originated and was carried out. There are many other ways in which ideas may occur. And I must explain here, that I am not presumptuous enough to be trying to teach the art of imagination, which is impossible, but how the imagination may be encouraged, stimulated, and strengthened. Some people have a sort of dormant imagination, which only wants waking up to be of great value.

Subjects sometimes start up in the most unexpected manner. I well remember one that occurred a few years ago. We were walking through an orchard on our way to photograph a scene that had been previously selected, and had to pass through a door in a fence into the road. One of my models, who had a stick in her hand, ran forward to open the door, and, when it was open, turned round to greet us as we passed, quoting, laughingly, the old nursery rhyme—

"Open the gate and let her through,
For she is Patty Watty's cow."

What a lovely pose she fell naturally into as she spoke! I give a little illustration of it, but the sketch only faintly recals the original. The title was "For the Cows." This must, of course, be secured at once; no sketch, and leaving till another day, was admissible. Thanks to the advantages of the gelatine process, and a camera that is ready for action in little more than a minute, an exposure was made before the pose had lost its freshness or the smile died on the face. But, on the other hand, thanks also to the disadvantages of dry plates as then made, the picture was not good enough to exhibit; the emulsion being much thicker on one part of the plate than another, the picture was not quite up to exhibition pitch. The film was uneven *in the wrong place!* These uneven films sometimes give good effects. I once took a medal with a picture that had very little to recommend it to the attention of the judges except a startling arrangement of chiaroscuro which I attributed entirely to the unevenly coated plate.

In the photograph to which I have just referred, the subject appeared with all its surroundings complete, and did not require any alteration or correction; but some subjects occur in which the figures are not exactly *in situ*, and these must be treated with thought and judgment. Shortly after the "For the Cows" was taken, I saw the same model on the bank of a stream, shouting to her companions, "Can I jump it?" Here was a subject at once; but the background was ugly and unsuitable. Another was at once hunted up, and found. As it happened, the nook in which the figure appears was inaccessible to the model; she could neither jump the water, nor get to the appointed spot in any unaided way. But a trifle like this should never be allowed to stop enthusiastic photographers. My models and helpers are often more enthusiastic than I am myself. In this case, the helper I had with me picked up the young lady in his arms, and waded across the stream with her.

Adaptation from the works of others is a delicate process which I can only suggest in a very vague way. There are some painters who will copy a photograph and call it their own in the most unblushing manner. Even if that photograph should contain a perfectly original idea, something never thought of before, they will argue—"Oh! it's only an accident in nature the machine has met with; it is impossible for it to be the photographer's own thought—they never think, because they use a machine." I would caution the photographer to be honest, or, anyway, not to indulge in wholesale robbery. It is not right, for instance, to dress up a figure exactly like a figure in an engraving, give it the same pose, and, in fact, reproduce the engraving as nearly as your means permit, and then exhibit the photograph as your own original thought. On the other hand, I consider it legitimate to "convey" a hint from a painting or engraving. A slight hint may originate a perfectly new design; but it is nothing less than a crime to carry off ideas wholesale and call them your own.

It is difficult to get quite new incidents even in this kaleidoscopic world of ours; and we should find, perhaps, that they would not be understood if we did. Sir Joshua Reynolds said that it is by imitating the inventions of others that we learn to invent. William Morris, in his

lectures on "The Lesser Arts," boldly says: "I do not think it too much to say that no man, however original he may be, can sit down to-day and draw the ornament of a cloth, or the form of an ordinary vessel or piece of furniture, that will be other than a development or a degradation of forms used hundreds of years ago." If Solomon was right that there was nothing new under the sun, nature also teaches us that everything that has the appearance of novelty is not really new, but simply a variation on some previous form evolved from something that has gone before. Evolution, therefore, in picture-making, I hold to be right; but the picture you produce from the germ you have adapted should no more resemble the original in composition or subject than a man resembles a gorilla. There may be a suspicion of likeness; but it should suggest only a far-off relationship.

Anthony Trollope, in his autobiography, tells us that all his plots were of his own devising, except one which was drawn out for him by his brother. His remarks on originality of subject come in very appositely here. "I mention this particularly," he says, "because it was the only occasion on which I had recourse to some other source than my own brains for the thread of a story. How far I may have unconsciously adopted incidents from what I have read,—either from history or from works of imagination,—I do not know. It is beyond question that a man employed as I have been must do so. But when doing it I have not been aware that I have done it. I have never taken another man's work, and deliberately framed my work upon it. I am far from censuring this practice in others. Our greatest masters in works of imagination have obtained such aid for themselves. Shakespeare dug out of such quarries wherever he could find them. Ben Jonson, with heavier hand, built up his structures on his studies of the classics, not thinking it beneath him to give, without direct acknowledgment, whole pieces translated both from poets and historians. But in those days no such acknowledgment was usual. Plagiary existed, and was very common, but was not known as a sin. It is different now; and I think that an author, when he uses either the words or the plot of another, should own as much, demanding to be credited with no more of the work than he has produced."

Then what vast numbers of subjects are to be got from reading! I like to reduce all I have to say to practice, or to give a definite example. I will, therefore, take a poem, and endeavour to show how subjects are suggested by it. I take Gray's "Elegy in a Country Churchyard," because it is so well known, and has been so well "worked" by artists.

Twilight has not been much used as a theme for photographers; yet it is perfectly easy now to produce all the effects to be noticed at the close of day. What could be more suggestive for pictures of this sort than the opening of Gray's poem? It is so well known that I will not quote it; but can anything be finer or more poetical for a picture than that called up by the lines:—

> "Now fades the glimmering landscape on the sight,
> And all the air a solemn stillness holds."

And there is scarcely a bit of country in England that would not afford materials to illustrate the lines. To London photographers they are especially available—as, if they want literal fact, Stoke Pogis, where the poem was written, is within easy distance, and the actual scenery may be used, especially the "ivy-mantled tower." But the scene that Gray had before him when he wrote the poem is not necessary. A prosaic, fact-giving photograph is not required; the sentiment of the scene is the quality the student must endeavour to secure and represent.

The poem is full of picture-giving lines; some are so plainly descriptive, such as—

> "The ploughman homewards plods his weary way,"

as to require no effort of the imagination to see them at once; others are suggestive, and all the more valuable on that account. Of this kind is the line—

> "Brushing with hasty steps the dews away."

In the poem this line applies to a poetic youth, but the artist is not called upon to literally follow the poem; the line itself may be taken without the context, and there are then infinite possibilities in it for other applications—for instance, it would apply to a village maiden skipping along the fields at the break of day, basket on arm or hay-rake on shoulder.

Milton's L'Allegro and Il'Penseroso are also full of lines that ought to wake the student's imagination, and it would be good practice for him to look for pictures with his mind's eye of the scenes suggested. It would also be useful study for him to look over the titles of pictures in an old Academy catalogue, and when he comes to one that strikes his fancy, to endeavour to make a sketch of the composition as it presents itself to his imagination.

I repeat, and insist most strongly, that the best subjects are those that come spontaneously to the well-practised artist, and the suggestions I have made are only intended to show the student how to stimulate and educate his imagination. He must recollect that if, in taking suggestions from the work of others, he does not get very far from the germ of the thought, and if his design is any more like the original than Monmouth was like Macedon, his design is but second-hand; and even supposing the public does not find him out, there will be his own conscience still left; and if it is anything like a decent conscience, it will be bad for it to be haunted by the ghost of plagiarism.

Correspondence.

OUT-DOOR PHOTOGRAPHY.

Dear Sir,—Your correspondents who complain of the refusal to permit photographers to take views of such places as Battle Abbey and Raby Castle should not be so easily deterred.

I have had several similar experiences, and a letter to headquarters has always obtained the desired permission. The porter in one place referred me to a firm of solicitors in the town, saying that only one local man was allowed to take photographs. On application to them, they regretted very much that they could not give permission. Not satisfied, I wrote to the Duke (not of Cleveland) himself, and by return of post received the required permit from his secretary or factotum. The fact seems to be that the local man has squared with the porter and agents, and a passing photographer may not have the time or perseverance to go farther.

I may remark that nobody has any business to prevent a view from being taken from a public road, and if I remember right (for it is more than thirty years since I photographed there) the principal front of Battle Abbey faces the road.—Yours truly, Russell Sedgfield.

DIFFUSED LIGHT IN THE DARK-ROOM.

Sir,—In reading your article on "Diffused Light for the Dark Room" in your issue of January 11th, I was reminded of the experiments made by Mr. Augustus Marshall and myself in 1880, in which the conclusion was reached that ruby glass *ground* would accomplish the object of transmitting light enough to enable the operator to perform his work comfortably, and would shut out enough to prevent the fogging of his most sensitive plates. It was to remove the objection of the dazzling effect of the red glass that Mr. Marshall suggested the grinding of the colourless surface of the glass. The result is thus stated in an article written for the National Association in

1881:—"It gives the glass the appearance of a deep orange hue, removes the dazzling effect, and, while it cuts off a portion of the light, diffuses what is left in a greater degree than the unground glass."

So you see, Mr. Editor, that your interesting experiments in England in 1884 were substantially anticipated by us in Boston in 1880. You suggest the combination of an orange-coloured glass and a ground glass, and we suggested the grinding of a red until it looked like a dark orange glass. We suggested at the same time that the addition of a ground glass would have the same effect as grinding one of the surfaces of the coloured glass.

In your paper for April 2, 1880, I have given you another instance of similar and simultaneous experiments on both sides of the Atlantic. One of your correspondents, on February 13, suggested the grinding of ruby glass for the developing room, and I received your paper on the same day that my proof of an article arrived from the office of the *Philadelphia Photographer* announcing the same suggestion. I am glad that our experiments brought us both so nearly to the same conclusion.—Yours truly, THOMAS GAFFIELD.

Boston, January 24, 1884.

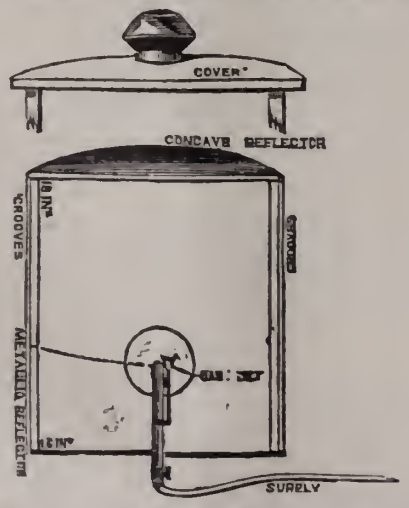
[We are very glad to print Mr. Gaffield's note, who was certainly one the first—if not the first— to advocate the use of ground glass. It is not, however, quite the same thing to "suggest the combination of an orange-coloured glass and a ground glass," and the "grinding of a red until it looked like a dark orange glass." We mean that "orange-coloured" glass and "red" glass are different.—ED. P.N.]

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 31st ult., Mr. F. W. HART, F.C.S., in the chair.

Mr. A. COWAN exhibited a lamp combining the principal features of Mr. Debenham's cathedral green glass and yellow paper, with the doubly-reflected rays obtained by Mr. Starnes. The semicircular back upon which the rays are reflected is covered with yellow paper, and forms a safe light for developing at a distance of four feet. When this light is filtered, by sliding into the grooves shown in the sketch one thickness of cathedral



green glass and four thicknesses of yellow paper, it produces no effect on a rapid plate exposed fifteen minutes close to the screen. The experiments reported last week were made with a similar lamp 24 by 18 inches.

Mr. A. L. HENDERSON, referring to his experiments with Mr. Starnes' lamp, said it would be remembered that a wet plate was badly fogged by exposure to that light; he did not think a perfect light had been discovered yet. An Edinburgh photographer was experimenting with complementary colours on a screen, and he believed it would be in that direction a safe light would be obtained. He also passed round some developing trays made of varnished wood with glass bottoms, having a well at one end, similar to the horizontal swing bath; a piece of string being stretched across to prevent the plate adhering to the bottom of the dish.

Mr. W. M. ASHMAN: String would be found a source of annoyance—cat-gut would be better; but neither would be as suitable as fine brass binding-wire.

Mr. J. B. B. WELLINGTON said he forgot to mention in the formula he gave last week that 200 grains of gelatine were to be stirred in as the emulsion is allowed to cool; he showed plates coated with this emulsion, in which halation was very great, and enquired the cause.

The CHAIRMAN: The plates are too thinly coated. Had Mr. Wellington tried backing the plates?

Mr. WELLINGTON had not. With regard to the colour, the developer was modified—viz., ferrous oxalate, 1-8, with the addition of thirty minims of a 120-grain solution of bromide of potassium. The opal picture received two minutes' exposure from an oil Sciopticon; as much emulsion as possible was poured off the plate after coating.

Mr. DEBENHAM and Mr. COWAN thought the shadows were amply rich enough to give a good result with a suitable negative.

Mr. A. MACKIE said, in reference to the swing-back question, he had fully considered it, and must now admit that Mr. Debenham was perfectly right.

The members then resolved themselves into committee to consider the resignations of Mr. C. B. Cutchey and Mr. J. J Briginshaw—the two secretaries.

Ultimately the office of co-secretary was abolished, and Mr. J. J. Briginshaw, Park Villa, Grosnover Park Road, Walthamstow, was appointed secretary.

It was mentioned that the Chairman (Mr. F. W. Hart) would deliver his "lecturette," on Thursday, the 14th inst., on "Residues."

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE seventh general meeting of the session was held in the Religious Institution Rooms on Thursday, the 24th January, Councillor ROBERTSON in the chair. Besides the usual members, there were present: Mr. A. L. Henderson, of London, and Mr. J. G. Tunny, of Edinburgh, whom the Chairman introduced to the meeting.

The minutes of last meeting having been read and approved of, the question-box was opened, and found to contain this question:—"What is the best method of enamelling silver prints?"

Mr. URIE said the process was exceedingly simple. A glass plate is cleaned, rubbed with French chalk, and coated with collodion. When dry, the collodion is varnished with a thin coating of gum-dammar in benzole to prevent the gelatine mountant permeating the collodion. The print is then mounted down on the plate with gelatine, a thin sheet of paper is mounted on the back of the print with the same medium, and, when dry, it is stripped from the glass.

Some discussion then took place as to the advisability of using varnish on the collodion—the arguments for and against being about equal.

Mr. HENDERSON thought enamelling photographs a mistake altogether. In his experience they faded considerably quicker than plain albumenized prints. He thought the addition of the benzole varnish to the collodion was a decided improvement.

Mr. BLAIKLEY showed a circular camera, constructed almost like an expanding pasteboard collar-box or circular concertina; the lid (on which the focussing screen and slides work) revolving on the body of the box, so that either an upright or oblong picture can be taken without changing the camera. This lid is prevented from coming off by means of four screws or pins working in a groove cut round the box. The front part of camera is, as it were, the bottom of the box cut out. To this one end of the bellows is attached, the other to the inside edge of the box next the lid. The bellows is made octagonal, but the ends readily accommodate themselves to the circular form. The tail-board is simply a flat rod (about one inch broad by three-eighths inch thick), cut in two, and each half hinged to the triangular top of the tripod, so as to fold down against stand when

not in use. When in use they are kept in position by a pinching screw and small plates with socket. The focussing arrangement is that of a rack-and-pinion, the rack being inserted along the bottom of the rod. The focussing screen is not hinged, but slides in the same groove as the dark slide, and is prevented by a check from coming out entirely. A small spring is fixed between the box and lid so as to snap and retain in upright or oblong position. The wood is plane tree ebonized, and, being all turned, the cost is very little.

Mr. McGhie exhibited several pieces of apparatus, including a camera; also a drying box, 21 inch by 12 by 12, which was capable of holding six dozen quarter plates. The ledges on which the plates rest (face downwards) are bevelled. The ventilators, top and bottom, have dust checks; a continuous stream of cold air passes over the surface of the plates, which dry in from six to eight hours; also a dry plate lantern with three distinct forms of light—ruby light with a shade for the eyes, white light for making transparencies; and opal glass for examining developed plates adapted for either gas or oil. He also exhibited a studio shutter, the flap of which was divided in two parts, and opened sideways by a pneumatic arrangement.

Mr. Lorne Campbell showed a picture of a transformation scene in a pantomine; it was exceedingly sharp and well defined in every part.

The Secretary showed the result of some experiments he had made with some extra sensitive ready sensitized paper which he had received from Mr. Otto Schölzig. The experiments proved the paper slightly more sensitive than ordinary paper, but more difficult to tone.

The Chairman then called upon Mr. J. Y. McLellan to introduce a discussion on "The Cause of Fading in Silver Prints."

Mr. McLellan commenced by pointing out the importance of a knowledge of this subject, from a general as well as a photographic point of view. We could not, he said, look over our own or our friends' albums, but we were made painfully aware of the fact that many of the so-called old-fashioned photographs were rapidly fading away. This was all the more to be regretted since these old photographs were often the only remaining portraits of departed friends, and their value consequently increased with years. He remarked that in his opinion, there were two kinds of fading: one which might occur at an early stage in the life history of the photograph, and which could generally be attributed to faulty manipulation on the part of the operator; but the more important form was that which took place after many years, and which could not be accounted for in this way. He had given the matter a good deal of consideration, and had come to the conclusion that the cause of this insidious form of fading was entirely due to atmospheric influence. He said that some years ago he was interested in a chemical investigation undertaken to discover the cause of decay in the leather bindings of the books in a gentleman's library. These books were submitted to analysis, and found to contain considerable quantities of sulphuric acid, and the only legitimate explanation of this seemed to be, that the sulphur compounds in the gas on burning were converted into sulphurous acid, which was absorbed by the books, and ultimately became oxidized into sulphuric acid, and so accounting for the corrosion of the book-bindings. He said that in his opinion this was also the cause of the fading of photographs after keeping for many years. In order to put it to the test, an old faded photograph which had hung upon the walls for fifteen years was torn into pieces and immersed in water; this became strongly acid on testing with litmus paper, and on the addition of barium chloride gave a dense white precipitate of sulphate of barium, proving the presence of a large quantity of sulphuric acid; the water also decolourised permanganate of potash, which suggested the presence of some reducing agent. He said that his experiments up to the present were merely preliminary tests, and that he hoped soon to go into the subject quantitatively, and strongly recommended it to the members as an important subject for investigation. An interesting discussion followed, and several members having intimated their intention to investigate the subject experimentally, the Chairman proposed that the discussion should be continued at the next ordinary meeting on the 21st of February, and it was arranged that Mr. A. Duthie should read a paper on the subject that evening.

Mr. A. L. Henderson was then elected an honorary member, and Mr. M'Kenzie, Paisley, an ordinary member. The meeting closed with votes of thanks to the exhibitors of apparatus, Messrs. McLellan, and the Chairman.

Liverpool Amateur Photographic Association.

The ordinary meeting of the above Society was held at the Free Library, on Thursday, the 31st ult., Mr. B. Boothroyd, President, in the chair.

The minutes of the annual meeting having been read and confirmed, the Chairman, after a few graceful valedictory remarks, vacated his post, and Dr. Kenyon, the President for 1884, took the chair.

Messrs. Cockbain, Irvin, Kerry, Morris, Parkyn, Robinson, Smith, and Watts were elected members of the Association.

The Hon. Secretary read a letter from Mr. Frank Leslie, the chairman of the Executive Committee of the Associated *Soiree*. The consideration of this, on the motion of the Rev. T. B. Banner, seconded by Mr. J. A. Forrest, was deferred till next meeting.

Dr. Kenyon then delivered the following Inaugural Address:—

"Looking at our doings from outside, we find ourselves as photographers engaged in one of the most wonderful of all the wonder-working processes of this eventful age. The dream of the necromancer of the middle ages is well-nigh fulfilled by us every day. If we cannot actually transmute the baser metals to gold, we can transmute inert and sordid matter into the pure gold of ethereal beauty. We can bring to light the secrets of the invisible changes of the minutest molecules. We can seize with a rapidity which would satisfy the recording angel the fleeting actions of time. We resemble those ancient sorcerers in less agreeable ways. Like theirs, our proceedings are not very highly esteemed by the common herd. Fortunately, we receive more compassion than blows; but the fact remains that we are not always so highly appreciated as we could wish. Witness Capt. Abney's story of the Spanish peasant who gave him a halfpenny." The Chairman then, after a very interesting record of his photographic experiences, which was, as he stated, in some degree an epitome of the history of the science, proceeded to remark:—

"I will now say a few words about a rival attraction which is absorbing much attention, and which is not altogether a rival, either, but has special claims upon us as photographers. The development of the tricycle during the last two or three years is comparable with the rise and progress of gelatino-bromide, and, like it, has created a new industry of even national importance. There is a closer affinity between cycling and photography than is at first sight apparent.

"To paraphrase a familiar saying, much though I love photography—great as is the charm of devising and accumulating apparatus and of working the varying and multitudinous processes—I love the objects I wish to photograph even more: the mountains and rocks, the landscapes, the sea, the clouds, objects of architectural interest, and the countenances of one's friends. It is because these are so dear that photography is most beloved as a means of securing a closer communion. And what, I should like to know, more deeply engraves upon one's soul the features of a delightful country than riding through it on a tricycle? The very exertion—nay, toil—of the journey ensures an acute remembrance of its details; and what more promotes good fellowship than the freemasonry of the wheel? As in photography there is scope for exertion, inasmuch as there is a heavy weight to be carried about, and there is a delicate machinery to be cherished with almost humane affection. As in the pursuit of photography, diversified scenery is brought into view. There is abundant scope for ingenuity and invention, both in mechanism and field of operations. What is more to the point: in the tricycle we have a most useful means of transporting photographic apparatus. In the autumn of 1879 I took with me on a "Salvo" tricycle through the heart of Wales a 7 by 5 camera, stand and plates, along with a knapsack, weighing altogether some thirty pounds. On my "Climber" tricycle (a fifty-two inch) I can comfortably carry a Rouch's 12 by 10 camera, and half-a-dozen plates, with stand. As many of the cycling clubs are forming photographic divisions, it might be worth while for us to think of forming a cycling division.

"Passing on to consider the progress made during the past year in the practical working of photography, we have to notice that in the gelatino-chloride process one source of weakness seems to have been effectually removed—a source of weakness due to the very perfection of gelatino-bromide in regard to sensitiveness. In gelatino-chloride we have the means, apparently, of doing with gelatine what hitherto has still to be looked for elsewhere, namely, the perfection of transparencies, whether for lantern purposes, enlargements, or reproduction of negatives. I hope, in direct printing on gelatino-chloride plates, many of us

will find greater ease, certainty, and economy than in the development process. And I venture to hope that, through gelatino-chloride emulsion, we may come to a perfect paper process—one which will give the perfection of a glass transparency on paper, free from the loss of detail and finish sustained in the toning and framing of ordinary paper prints. This, it occurs to me, might surely be attained by some such process as by coating Messrs. Goodall and Stevens' enamel paper with gelatino-chloride.

"The magnificent enlargements, exhibited by Professor Donkin, of Swiss mountain peaks, are a great encouragement for those who look to obtaining from small plates enlarged negatives equal to large pictures taken direct; and here, again, I would suggest that gelatino-chloride will come in useful, for a brilliant transparency may by this process be obtained from a negative otherwise unfit for enlargement.

"There is still much room for improvement in cameras, but serious efforts are being made to supply the want. This, I submit, will only be satisfied with an automatic arrangement for exposing plates or films carried *en masse*, and I would suggest that a great step would be secured if the sliding shutter of the dark slide were replaced by a hinged shutter opening entirely within the camera; this might easily be done.

"In the working of the gelatino-bromide process, valuable additions have been made to our resources in the introduction of the citrates, as a means of obviating the results of over-exposure, and in the improved methods of silver intensification. The use of the carbonate of soda developer appears to be gaining ground, and I have myself had very satifactory experience of its usefulness.

"A great improvement in the illumination of the dark-room for development purposes is now obtained, and this seems likely to find its perfection in the use of a monochromatic light such as is announced from Paris to be obtainable by a mixture of spirit and perchlorate of soda burned in a spirit lamp. This is said to give an abundant yellow light free from actinic influence. For the illumination of dark interiors or portraiture by night, where a short exposure is desirable, we have had brought forward in the oxy-magnesium light the very *acme* of an inexpensive and portable device.

"In this connection I may point out that for copying pictures and small objects, where a longer exposure is admissible, the lens of a graphoscope, for rendering parallel the rays of a paraffine lamp, answers admirably, whilst for making enlargements on gelatino-bromide paper from small negatives the same lens, used along with a smaller, shorter-focus, double-convex lens to act as a condenser, will be found effective with the same simple source of light, the precautions necessary being to place—1. The condenser at or about its focal distance from the lamp. 2. Place the graphoscope lens at or about its focal distance from the condenser. 3. Having placed the negative close to the graphoscope lens in the slide of the camera, to use for making the image a lens of longer focus than the graphoscope lens, and, if possible at least so large an aperture as that of rapid symmetrical type."

Mr. J. A. FORREST proposed, and Mr. J. H. CORKHILL seconded, a vote of thanks to the President, officers, and judges of the past year.

After a discussion on the election of honorary members, it was agreed:—"That the election of honorary members be by ballot, and their re-election annually should not form part of Rule V."

The CHAIRMAN distributed certificates of honourable mention to the following gentlemen, whose pictures had gained prizes in the competition for 1883:—Messrs. Beer, Ellerbeck, Hall, Kirkby, and the Rev. H. J. Palmer.

Mr. ELLERBECK (Hon. Treasurer) spoke at some length on the financial position of the Association, pointing out that, owing to the large and rapid growth of the numbers of the members, and the very large attendance at the monthly meetings, it would be necessary to economise the working expenditure considerably, since it would no longer be possible to give each member a presentation print of the cost of half his subscription, and provide him with tea at each of the meetings.

After some discussion it was decided to present each of the members entitled to it with an unmounted enlargement of the usual size.

The Hon. SECRETARY gave a report of the Society's exhibition at the Associated *Soiree*, gratefully acknowledging the labours of Messrs. Crowe, Forrest, and Guyton in co-operating with himself in the arrangement of the pictures.

Mr. PALMER also related his experiences at Sheffield on his recent visit to the Exhibition there, to which the Liverpool Amateur Photographic Association had contributed a large number of exhibits.

Mr. MCKELLEN, of Manchester, exhibited and explained his new portable and ingenious camera, and received the cordial thanks of the meeting.

The Rev H. J. PALMER wished to make special mention of the kindness of Professor Donkin in sending down for their enjoyment that evening his splendid transparencies of his views in the High Alps, and a hearty vote of thanks was proposed and carried unanimously.

Mr. J KNOT then showed Professor Donkin's pictures in the oxy-hydrogen lantern, and also a number of other slides contributed by Dr. Kenyon, Mr. Newhall, Rev. H. J. Palmer, Mr. A. Scott, and others.

Hearty votes of thanks were proposed and carried to Mr. Knott and Professor Donkin and the other exhibitors of slides.

Mr. A. W. BEER showed a new carrier for the lantern by Mr. McKean, of Edinburgh, for instantaneously changing the pictures on the screen. Its ingenious construction was much admired. Mr. Beer also exhibited a portable adjustable view-meter of fine make and finish, designed by himself and made for him by Mr. Crowe.

The Rev. H. PALMER exhibited some fine enlargements, by Morgan, on gelatino-bromide paper, of negatives taken by him at Chartres and in Switzerland.

The Council finally decided upon an enlargement of Mr. Palmer's "North Portal of Chartres" as the presentation print for 1883.

Some prints on a new doubly-albumenised sensitive paper, by Mr. Scholzig, were to have been exhibited and discussed; but, owing to the pressure of business, these and other matters were postponed to the next meeting.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE annual general meeting of this Association was held at the Society's office on January 30th, Mr. W. S. BIRD presiding.

The minutes of the previous meeting having been read and confirmed, Messrs. E. G. Ganly, F. T. Beeson, and W. H. Penn were elected members of the Association.

The SECRETARY then submitted his report, with balance sheet and summary of proceedings of the Society since its foundation as follows:—

Secretary's Report.

In submitting my report of the business done by the Association during the past year, I desire to call attention to the fact, that although the total receipts are not equal to those of 1882, the position of the Society is really improved, a considerable increase of members having been enrolled during the last few months, and the funds of the Association having increased from £139 18s. 1d., to £159 9s. 8d., being a clear gain of £t 9 11s. 7d. during the year.

Receipts.—The honorary members have contributed £24 3s. 6d., the ordinary members £17 5s., and the proceeds from the evening at the exhibition of the Photographic Society £6 6s. 7d., making a total of £47 15s. 1d.; the difference between receipts for 1882 and 1883 (£10 0s. 11d.) are accounted for by the fact that in the former year, several gentlemen combined to hold a soirée and ball, which realized £19 16s. 6d. in aid of the funds. It is to be regretted that the experiment was not repeated for 1883. Further, the proceeds from the exhibition are £3 19s. 5d. below those of last year; it will therefore be seen that the reduction in the income of the Association has not arisen from a decrease in the honorary or ordinary members' subscriptions, which combined are £3 15s. in excess of this source of revenue in 1882.

Expenditure.—The assistance given has been of very moderate amount. Non-members still continue to apply for assistance, and if the rules allowed such applications to be entertained, the funds of the Association would be rapidly reduced; the plea generally given in reply to the query as to why applicants had not joined the Association being, "Oh, I did not know of its existence." It is a matter of surprise how they found it when its help was required. The working expenses have been £22 3s. 6d., or £1 16s. 3d. less than last year.

Board of Management Report.

It is again the duty of the Board to submit its annual statement to the subscribers and to the members of the Association, and to add a few words to the information as to the preceding year contained in the Secretary's report given above. The facts this year are less encouraging than in the previous one. There has been a welcome increase in the receipts from honorary sources through the generous contribution of E. Horner, Esq.

but the receipts from ordinary members exhibit a slight decreasc. Considering the length of time the Association has been in existence, the amount of publicity liberally afforded by the photographic press, and the advantages derived from the annual benefit night at the exhibitions of the photographic societies, your Board cannot but feel that the progress made towards the realization of its aims is but slow. At present the great majority of the photographic professiou, both masters and men. are practically indifferent. It behoves the members to consider whence arises tbis apathy, and what means can be taken to remove it.

The organization of the Society is arranged on an entremely economical scale, and it appears to the Board nothing further can be done in this directiou if auy administration is to be maintained. With a very trifling extra outlay ten times the present work of the Association can be carried on, in which case the proportion of the expenditure to effective results would compare favourably witb any benevolent organizatiou extaut.

The foundation of a Photographers' Beuevolent Association has been laid. There is an accumulated fund of about £160, and an effective administration; but for a real success the hearty co-operation of the members of the photographic profession is absolutely essential.

The Association has been instrumental in obtainiug employment for many of its members, has furnished means to enable them to proceed to the provinces when required, and has rendered material pecuniary assistance to many whom adverse circumstances have placed in the positiou to need it.

Its power of doing good is necessarily limited by the resources at its disposal. It has now entered the tenth year of its existence, aud may, perhaps, claim to merit the largest support it needs for effective working.

Both reports were adopted.

The Chairman then said the report had placed before its members the position of the Society, and stated tbat the Board, which consisted of the faithful few, would be glad to receive co-operation, aud asked for suggestions which would tend to iucrease interest in the Association.

Mr. Ashman said the rule making two classes of members appeared to be a mistake, and to his knowledge deterred some of the profession from supporting the Society. There was no objection to receiving donations from anyone, and to any amount, but why an annual subscriber of one guinea should not participate equally with the half-guinea subscriber seemed a puzzle to many; he would suggest altering the rule. Another matter was the amount of subscription. Why not reduce it to 5s.? Masters and men would gladly pay that amount, who uow withhold a guinea or half-guinea. When employers became regular subscribers, they will have no hesitation in referring needy cases to the funds.

Mr. H. J. Thorne considered the rule admitting two classes of members was one which needed altering; he was not prepared to go so far as the previous speaker, and reduce the subscription.

Considerable discussion took place, in which the Chairman, Mr. Rolph, and others joined. The feeling of the meeting was strongly iu favour of one kind of subscription—only members, in fact, to be on the payment of 10s. 6d. annually. It was felt first that the justice of the case demanded that every member should be entitled to the benefits of the Association; and secondly, that many gentlemen would, in addition to the fee of membership, give further subscription or douatiou. It was resolved that steps should be takeu to alter the rule.

The Association having sustained a loss during the year of two officers—J. H. Dallmeyer, Esq., one of the Vice-Presidents, of whose benevolence the Society has had testimony, and C. G. Collins, Esq., a good working member of the Board—the meeting desired to express tbeir sympathy with the relatives of these gentlemen.

Tbe following are officers for the ensuiug year :—

Vice-President—Rev. F. F. Statham, M.A., F.G.S.

Trustees—Col. Stuart Wortley, Capt. W. de W. Abney, R.E., F.R.S., F.C.S.

Treasurer—H. Baden Pritchard, Esq.

Auditors—G. Taylor, Esq., aud J. S. Rolph, Esq.

Board of Management—W. S. Bird, Esq. (chairman), H. J. Tborne, Esq. (deputy chairman), Messrs. W. M. Ashmau, H. J. Burton, T. Bolas, A. J. Brown, F. H. Berry, E. G. Gauly, J. A. B. Hall, A. E. Hyde, F. J. Mitchell, J. S. Rolph, J. S. Sauuders, and R. E. Wilkinson.

Secretary—H. Harland.

The meeting terminated with thanks to the Chairman.

Postal Photographic Society.

A committee meeting was held February 6th, the President in the chair, aud after tbe minutes of the previous meeting bad beeu read aud confirmed, the following candidates were elected members:—H. G. M. Conybeare; A. Suzanne; Rev. A. M. Macdona; Rev. H. Victor Macdona; Rev. J. Carter Browne, D.D.; Rev. Locke Macdona; John Hollway; Rev. H. Von E. Scott; H. E. Lees; T. Mansell; Harold Sands; F. Pardoe.

It was resolved that, for the future, "All pictures of whatever size, intended for competition, be excluded unless mounted on card of the uniform size of 15 by 12 inches, and uniform thickness, four sheet."

The thanks of the Society were ordered to be sent to the editors and publishers of the Photographic News and of the *British Journal of Photography*, for copies of their respective Almanacs kindly placed at the disposal of the Society.

Competition No. 3, which had completed its first round, was then examined. Mr. Baylis had acted as scrutiueer of the votes, and anuounced the numbers as follows:—

Class I.—Landscapo of size between 5 by 4 to 10 by 8—1st prize, H. H. Cunningham; 2nd prize, G. Bankart.

Class II.—Portrait of member takeu by himself—prize, W. Adcock.

Class III.—Architectural subject—1st prize, F. Gorham Ticehurst; 2nd prize, G. Bankart.

Dr. Horace Day then moved that, in order to raise the quality of the priuts in the albums, a prize be given for the best picture in each album as decided by the votes of the members; but that each member to have one vote simply for the best picture, aud that the prize was to take the form of an enlargement in carbon from the negative; and it was resolved that, so long as funds permitted it, this course should be adopted.

Mr. J. W. Leigh had made a report to the Socicty upon samples sent it of Schölzig's seusitized albumenized paper, and on Scorah's canary medium, and it was ordered he should be thanked on behalf of the Society.

Talk in the Studio.

Photographic Society of Great Britain.—The annual meeting of this Society will be held on Tuesday next, February 12, at 8 p. m., at 5a, Pall Mall East, when tbe report of the council and the fiuancial report will be read, the electiou of officers take place, and other business brought forward.

Photo-Mechanical Printing Methods.—Mr. Bolas, in his second lecture, delivered at the Society of Arts on Monday last, treated of methods of making typographic blocks by photographic agency, and also of photo-litbographic methods. It was pointed out that, at the present time, the production of a transfer in fatty ink, or of a picture in a definite grain or stipple, is equivalent to the production of a block, so well is the method of zinc etching understood. The lecturer said that the more recent improvements depended upon tbe translation of the Wooddury relief into grain or line. Among the principal methods of effecting this may be mentioned Woodbury's metbod of making a grained relief by exposing Woodburytype tissue under a grained positive (see page 667 of our vol. for 1883); the methods of Ives (see pages 498 and 677 of vol. for 1883); Eggis (page 789 vol. for 1883), and the hitherto unpublished processes of Zuccato. Tbese latter methods are fully described on page 81 of our present issue. A transfer was inked up by means of the velvet roller, Mr. Newlands assisting; and the advantages of an india-rubber roller for machine or hand printing were alluded to. The india-rubber roller shown consisted of an outer coating of red vulcanized rubber, a liittle over an eighth of an inch thick, about half-an-inch of fine felt being between the rubber and the stock.

Dinner to Mr. A. L. Henderson.—Mr. A. L. Henderson, of Loudon, was entertaiued at dinner, on the 25th ult., in Young's Hotel, Cockburn Street, by the Edinburgh Photographic Club, when about forty geutlemen sat down to dinner. The chair was taken by Mr. J. G. Tunny. After the usual loyal and patriotic toasts had been drunk, tbe Chairman gave the toast of the evening, "Our Guest, Mr. Henderson." Mr. Henderson, ou rising to respond to the toast, expressed the pleasnre he felt in meeting so many members of the Clnb and other friends. He said tbat on his first visit to Edinburgh, about forty-five years ago, he had neither a shirt on his back nor a

shilling in his pocket. When of suitable age he went to assist a dispensing chemist in Frederick Street, Edinburgh. After being for a time assistant to a chemist, he went to London, and stated how he had saved enough to purchase his first camera and lens, and how, by gradual steps, he attained a position in London. He mentioned that it was while visiting the great Exhibition that he first saw some ceramic photographs, and when examining them he said that he thought he could produce better work; and in a fortnight after, he had produced work which it was thought not only equalled, but excelled that in the Exhibition. Mr. Henderson, in conclusion, advised all photographers above everything to acquire a good knowledge of chemistry. He thanked the Photo Club very warmly for the honour they had done him, and said it was a meeting he would never forget as long as he lived. Other toasts were duly honoured, and during the evening numerous songs were sung.

A MOONLIGHT PICTURE.—An old contributor, Mr. J. Henry Whitehouse, sends us a remarkable moonlight view of a New York Street, and he tells us that it was taken by Mr. Metcalfe from the window of his residence, on the night of December 13th last; the exposure lasting from 6.30 to 11.30. It is quite fully exposed, details being visible even in the deep shadows; but the observer can see at a glance that there is something unusual about the lighting. The picture is bright and well contrasted like a sunlight picture, but it is impossible to trace the general direction from which the light comes. It strikes one as curious to be able to peep into some of the brightly lighted rooms.

AT THE PHOTOGRAPHER'S.—"Chin a little higher, please. There, that is better—look at that nail." "Which one?' "That big nail near those two little ones. Your head is turned again; press it back against the support. There, that is better. I am all ready; now keep perfectly quiet, and assume a cheerful expression." "Beg pardon, but I forgot to ask you what you are going to charge me for these photographs." "Seventeen dollars. Now look pleasant."—*The Eye.*

PHOTOGRAPHIC CLUB.—At the next meeting on February 13th, the subject for discussion will be "Development of Gelatino-Chloride plates."

To Correspondents.

*** We cannot undertake to return rejected communications.

NITRIC.— 1. A solution of perchloride of iron etches both copper and steel very readily, and one advantage is the circumstance that no fumes are given off. 2. Saturate it with iodine, but take care that the solution is quite cold when the iodine is added. 3. Either the collodion has been made with a sample of pyroxylino which possesses unusual contractile properties, or the plate was not properly cleaned. 4. Sulphur answers very well, but care should be taken not to over-heat it, as it becomes viscous at a temperature not very much higher than its melting point.

EDWIN A. JEWITT.—Write to the Willesden Waterproof Paper Company, Willesden, N.W.

EDW. REEVES.—You can easily ascertain if it is a fact by making the following simple experiment. Cut a print in two parts, and attach one-half of the print to a mount from an old batch which has proved serviceable, and the other portion to one of the new mount cards. If both specimens are now kept under precisely similar conditions, you will soon obtain a conclusive answer to your question; and if the new mounts have caused the mischief, you should be able to recover ample damages from the manufacturers.

D. W.—Thank you for the sample of paper, which appears to be excellent.

AD. EGGIS.—We shall be very pleased to receive a description of the apparatus.

T. H. B.—The process is quite open, and unencumbered by any patent. In the "Studios of Europe" you will find full particulars for practically working it.

A. G. B.—1. We do not think that it possesses sufficient superiority to compensate for certain trifling disadvantages. 2. The discrepancy is due, as you surmise, to the difference between the two formulæ.

R. TUNNIS.—Nothing will serve your purpose better than Abney's "Instructions," which is to be obtained from our publishers.

CHAS. LIVERSTONE.—Disregard the threats, as the patent is worthless. We published full details of the same process as early as 1860.

B. R. C.—It is not sufficient, and if you will read the article through carefully, you will understand the reason.

A. HONEY.—1. Either the Collotype or the Woodburytype process will answer your purpose. The Stannotype is a modification of the latter, especially suited to the requirements of the business photographer. 2. Write to Mr. Woodbury.

J. P.—1. The silver can be thrown down from the waste hypo solutions by stirring in a little strong solution of sulphide of potassium. Allow the black deposit to settle, and add a little more of the sulphide. If no more of the black precipitate is formed, sufficient sulphide was added in the first instance. The black precipitate may be reduced to the metallic state by fusing it with carbonate of soda. 2. The waste pyro developer (gelatino-bromide) contains no silver, and is valueless. 3. By the action of heat on gallic acid, air being excluded as far as possible.

A YOUNG LITHO.—You will find full particulars on page 338 of our volume for 1883.

J. MOONEY.—The shilling hand-book published by the Autotypo Company may answer your purpose; or you can obtain the more comprehensive hand-book of Dr. Liesegang, this latter being published by Sampson, Low, and Co.

J. HARVEY.—Aniline dyes, such as Judson's, will answer as well as anything, but they should be considerably diluted with alcohol. It is often better to work with solutions so weak that several applications are required.

A READER.—The exposure given was probably ten or twelve times as much as was required, and "reversed action" set in. It is not very easy to obtain a good negative by the reversed action of light, but it may be done by impregnating the film with bichromate of potassium, and exposing under the original negative for a few minutes.

W. S. ATWOOD.—Thanks for your letter, which shall appear next week.

J. BURNDRED.—From your description we should think that your negatives are not sufficiently dense.

The Photographic News Registry.

Employment Wanted.

Assistant (Lady), tint, spot, &c.—A. G., 5, Heaton-vil., Heaton-rd., S.E.
Collotype Printer, expe.—E. Birch, 3, Alpha-ter., Boston-rd., Hanwell.
Operator and Retoucher, or to manage.—Operator, 18, Telford-rd., W.
Mounter, Spotter, Books (Lady).—A. E. G., *Photo. News* Office.
Opera. & Retouch, all branches.—Pyro, 1A, Prince-of-Wales-rd., Norwich.
Operator and Retoucher.—Manager, Eastover House, Bitton, near Bristol.
Assistant Operator.—A. G. R., Rosetta Cottage, Weeks, Ryde, I.W.
Retoucher & Assist. (Young Lady).—Miss J., 10, Edith-rd., Peckham, S.E.
Lady for Reception-Room. —E. D., 50, Crockherbtown, Cardiff, S. Wales.
Vignetter, good hand, first-class firm.—G. E. Lann, Market-st., Brighton.
Retoucher.—F. Piper, 56, Walford-rd., Stoke Newington, N.
Artist, for Monochrome and Water Colour.—Z. A., *Photo. News* Office.
Operator, clever at lighting, &c.—F.W., 1, Claylands-rd., Clapham-rd., S.W.
Reception Room, Young Lady of exp.—M. A. G., *Photo. News* Office.
Reception Room, Shop, Books, &c.—W. C., 160, Arlington-rd., N.
Youth, as Assist Op. or Printer.—L. D., Cambridge-gardens, Notting Hill.
Assistant Operator and Printer.—E. D., 576, Sunderland-st., Pimlico.
Recep. Room, Mounter, &c.—M. W., 68, Parma-cres., Clapham Junction.
Printer or Gen. Assist. (young man).—Evans, 9, Church-st., Folkestone.
Reception Room, Mount, Spot, Books.—F. W., Chryssell-rd., Brixton-rd.
Printer and Toner.—Printer, 24, Crick-st., Burdett-rd., E.
Operator, Retoucher, Enlarger.—Alpha, 115, High-st., Camden-town.
Artist, well up.—P. Eckhart, 105, Hall-pl., Hall-pk., Paddington.
Retoucher and Colourist (lady).—J. J., *Photo. News* Office.
Artist, medallist.—Miss A. H., 88, Stoke Newington-rd. N.
Operator or Manager.—A. E. Walker, Eastwood, Notts.
Assist. Printer & Vignetter.—G. E. Cann, Market-st, Brighton.
Assistant Operator, or Manage Branch.—H. W., Finsbury-circus, E.C.
General Assist., good all round.—X. Y. Z, 49, Ledbury-rd., Bayswater.
Assist. Op., &c. (town only).—C. H. E., 50, London-st., Tottenham-ct.-rd.
Assist., can print, tone, paint enlarg.—Silver, 40, Gower-st., Birmingham.
Assist., enl. on Morgan's pap.—F. P., 16, Rochester-sq., Camden-rd., N.W.
Assist., retouch heads for publication.—Retoucher, *Photo. News* Office.
Reception Room, as Improver.—X. Y. Z., 5, Jesse-ter., Reading.

Employment Offered.

Saleswoman and Stock-keeper, to spot, &c.—J. E. Bliss, Cambridge.
Retoucher, first-class.—W. McLeish, 71, Northgate, Darlington.
Young Lady Printer.—Gartside and Risley, *Photo. News* Office.
Retoucher, clever.—J. Hawke, George-st., Plymouth.
Dry-Plate Coaters, experienced.—Prestwich, 155, City-rd., E.
Photo-lithographer, experienced.—Photo., 150, Queen Victoria-st., E.C.
Photo , expe. largest cameras.—E. Meyerstein, 280, High Holborn, W.C.
Retoucher, for high-class work.—Mavius and Vivash, 49, Ann-st., Belfast.
Operator for N.W. Provinces, India. India, *Photo. News* Office.
Photo. Artist, first-class, all-round hand.—W. Knight, 47, Coney-st., York.
Young Woman, charge of Printing Room.—W. Winter, Midland-rd., Derby.
Printer and Toner, young, for City.—Viaduct, *Photo. News* Office.
Retoucher, first-class.—Negretti & Zambra, Photo. Dept., Crystal Palace.
Printer & Toner (female) to manage.—Holden & Co., 42, City-rd., Bristol.
Photo-lithog , perm. if comp.—X , c/o Smith & Co., Gresham House, E.C.
Traveller, to Sell Backgrounds.—Photo., 5a, York-ter., Clapham.
Printer, skilful Vignetter.—Morgan and Kidd, Helio House, Greenwich.
Silver Printer and Toner (good).—W. Wilson, 77, De Beauvoir-rd., N.
Photo-Lithographer & Photo-Etcher.—Meek & Co., 4, Cable-st., Liverpool.
All-round hand, wet & dry.—Tune & Co., Warrington House, Tottenham.
Retoucher of first-class ability.—H. W. Winter, Alexandra Rooms, Derby.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

USING CONCENTRATED SOLUTIONS IN MAKING EMULSIONS.

A LITTLE time ago we made some remarks on the effect of the amount of concentration or dilution of the solutions used in making emulsions. Further experiments in the direction in which we were then working show results that make us wish to add a little to what we said before.

The general tenor of our observations to which we refer, was to the effect that the amount of water used to dissolve the salts from which emulsions are made—that is to say, the silver nitrate and the bromide, and sometimes iodide of ammonium or potassium—has a great influence on the length of time taken to gain sensitiveness. That the less the water—in other words, the more concentrated the solutions—the shorter is the time required for sensitiveness to be gained.

We now repeat this statement, but more emphatically, and even go so far as to say that a variation in the quantity of water used in emulsifying and in subsequent boiling has more influence in the time taken to get a blue bromide of silver, than the variation of any other constituent of the emulsion, so long, at least, as those constituents are used within the limits of proportion which are considered permissible in emulsion work.

To take an example of what we mean, there will be much less variation produced in the time required to gain sensitiveness by varying the excess of bromide from the smallest that is commonly used, than there will be by varying the amount of water used to dissolve the salts, from the smallest given in any formula to the largest given in any formula. And yet we scarcely hear mention of the quantity of water as a factor in the question of gaining sensitiveness. So much is it neglected, that it is by no means uncommon to find formulæ given without any mention being made of the quantity of water in which the salts are to be dissolved.

On the assumption that the solutions are used neutral, the factor which has the next greatest influence in determining the time which will be taken for sensitiveness to be gained, is the amount of excess of bromide which is used. The greater the excess, the more rapidly will sensitiveness be gained, and this is more the case when the solutions are concentrated than when they are dilute. A certain increase in the excess of bromide will enable sensitiveness to be gained in half the time it was before, if the solutions are concentrated. With dilute solutions, the same increase of excess of bromide will have comparatively little influence on the time taken to gain sensitiveness.

The amount of gelatine used in emulsifying and during boiling has much less influence on the time necessary to gain sensitiveness than is generally supposed. Indeed, we have found that we may vary the amount of gelatine used within very wide limits, without much influencing the time required to convert the silver bromide from the variety red by transmitted light, to that blue by the same.

We shall here be more specific, and give two precise formulæ to illustrate the general statements which we have been making above.

	No. 1.	No. 2.
A.—Silver nitrate	200 grains	200 grains
Water	2 ounces	5 ounces
B.—Bromide of potassium	170 grains	170 grains
Gelatine	50 ,,	50 ,,
Water	2 ounces	5 ounces

It will be seen that between No. 1 and No. 2 there is nothing varied except the amount of water used. Nevertheless, if all solutions be used neutral, it will be found that after emulsifying, No. 1 can scarcely be raised to near the boiling point before the conversion from red to blue bromide is complete. Placing the quantity given in a glazed jar in boiling water, ten minutes only has, in our experience, elapsed before a blue and sensitive bromide has resulted. On the other hand, with formula No. 1—which, by the way, is only of use for a precipitation process—we have had to boil from two to three hours to bring about the desired change.

We are now assuming that the solutions are neutral. By making both or one of them decidedly acid, longer time will be necessary to gain sensitiveness in the case of both formulæ; and, in fact, in the case of No. 2, it will be found almost impossible to get it.

The solutions may be made even more concentrated than we have mentioned in formula No. 1; but, in this case, we have found it impossible to get a satisfactory emulsion to begin with, unless we use a good deal of acid. With neutral solutions so very concentrated as, for example, we would have if we used in No. 2 an ounce and a-half of water only, instead of the two ounces given, we have found it impossible to get a ruby emulsion to start with, and have even found it impossible to get the whole of the silver bromide in suspension at all. A bromide greyish blue by transmitted light has been got at once. This is fairly sensitive, if used as it is, but gives plates of very poor quality.

Our present practice is to so proportion the quantities used, that we may get sensitiveness in a time somewhere between the two limits which we have mentioned. We fancy that the best result is obtained when about half-an-hour of boiling is required to cause the change from

red to blue bromide. This is the case with the particular samples of chemicals which we are now using when the following modification of the formulæ just given is used:—

A.—Silver nitrate	... ...	... 200 grains
Water	... ...	... 2½ ounces
B.—Bromide of potassium	...	... 170 grains
Gelatine (Nelson's No. 2)		... 50 ,,
Strong hydrochloric acid		... 1 mimim
Water	... ...	... 2½ ounces

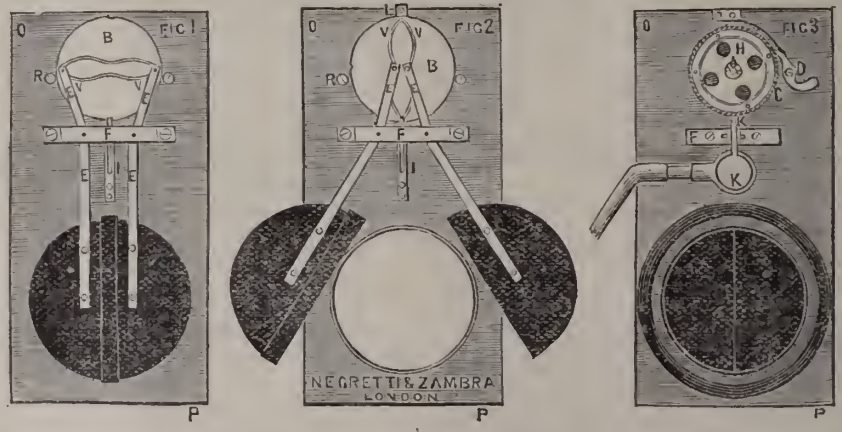
Half-an-hour of boiling with this gives a rapid plate, the conversion from red to blue bromide being then complete. Still greater rapidity can be gained by continuing boiling for fifty minutes or an hour. Boiling beyond this produces fog in our hands.

ZSCHOKKE'S INSTANTANEOUS SHUTTER.

AN ingenious application of the guiding-cam principle governs the opening and shutting of this apparatus, and a very little explanation will serve to make the subjoined diagrams intelligible to the reader.

The actual screens or flaps very closely resemble those of Mr. Spink's shutter, which was figured on page 321 of our volume for 1882; but the mechanical principles upon which it acts are quite different.

B (figs. 1 and 2) is a disc of metal which can be made to revolve on its axis, and in this plate a deep cam-channel, somewhat resembling the outline of an hour-glass, is cut, as shown in the diagram, and the bent arms E E, which carry the half discs, are provided with studs, which can play freely in the cam-channel. Now it is obvious that if the



brass disc be turned round a quarter of a circle, as in fig. 2, the shutter will be open, while a further movement of a quarter of a circle will close it again. A lever and catch (I) serves to fix the revolving disc at either one of two points, one being a quarter of a circle from the starting position, and the other point half a circle from the initial position, and it can be released from either of these positions by a pneumatic ball, situated on the other side, (fig. 3), lifting the catch through the agency of the lever K. It should be mentioned that a spring contained in a box, H (fig. 3), serves to constantly press the disc B back towards its starting point, and this spring can be wound up to any required degree of tension, so that the speed of the shutter may thus be adjusted with great exactness.

It will be seen that the Zschokke shutter combines in itself the main points of excellence which one looks for in such an apparatus—viz., opening from the centre, compactness in relation to the aperture covered, and steadiness of motion. It will give an exposure as short as one-fiftieth of a second, and one as long as half a second. The maker is Steinheil, of Munich, and it has been introduced into this country by Messrs. Negretti and Zambra.

CRAYON ENLARGEMENTS.

THE softness and permanency of enlarged portraits, carefully executed in coloured crayons, renders them very attractive, and specially valuable in many instances, as works of art.

The usual method of producing life-sized crayon pictures is by placing a diapositive in an ordinary magic lantern, focussing the image of the size required on a sheet of paper crayon, and then, in the darkened room, sketching in the luminous picture with great nicety and exactness.

Such a sketch can be finished afterwards by the aid of a guide print from original negative, or better still by one or two sittings on the part of the subject. In the hands of a really good artist such a picture leaves little to be desired, being exceedingly life-like and pleasing. However, the demand upon the artist's power is very great, and the expense, consequently, considerable; and the likeness is sometimes lost; still, if the enlargement be taken on a sheet of bromide paper, by one of the processes recently described in these pages, the likeness is insured, but it is impossible to produce the same soft blendings of light and shade on a paper with a surface so different from that of crayon paper. We have found it comparatively easy to prepare a very suitable paper for this purpose by simply mixing with each ounce of good gelatine bromide emulsion, a small teaspoonful of powdered pumice-stone previously sifted through fine muslin. This is stirred up well, and a large sheet of paper coated therewith by either of the methods we have before suggested. Such an emulsion adheres rather badly to the paper, especially if the latter is used without drying; but this difficulty is soon got over by the use of a substratum. That which has proved satisfactory and most easily made and applied, in our case, is the one described by Captain Abney some two years ago, and is made by dissolving a small quantity of gelatine in acetic acid, by the aid of heat, and then diluting the solution with methylated spirit. We see no necessity for precipitating the gelatine as recommended, and then re-dissolving the precipitate in more acetic acid.

This can easily be brushed over the paper, or poured over if the paper be previously pinned to a flat board. Drying can be hastened by heat. The paper should be wetted in water before applying the emulsion. An exceedingly thin coating is required, as nothing more than a very thin grey image, full of detail, is necessary as a perfect base for future operations with coloured crayons. The emulsion must be well stirred before applying to paper, and we see no reason why the coated sheet should not at once be exposed in the camera or dark-room, as soon as the coating has set. Development should be arrested as soon as detail is out, as no strength of dark deposit should be there to interfere with the purity of the colours to be

applied; only a sufficient faint guide to the artist to render the retention of the likeness certain with ordinary care. Less artistic skill being required, less expense is incurred, and any photographer—professional or amateur—who can make a few ounces of good emulsion, can easily produce a life-size head ready for the hands of the colourist in crayon.

We may mention that, in our hands, the substratum just described has answered perfectly for opal work, either in gelatine or collodion, especially in cases where annoyance is caused by dust, as it can be dried off rapidly by heat before any dust can adhere to it. The emulsion as above can be used for opals, and will give a matt surface as with paper, and, like the latter, they can be coated and used at once, sufficient emulsion only being taken from the stock. It is well in this case to soak plates or paper in water before development, or air-bells may form white spots in the ultimate picture.

TRIP TO SAHARA.

BY A COCKNEY.

On a yellow 'bus in the Tottenham Court Road. Mind you, I don't say that this is the straightest way to the Great Desert. I believe that if, after passing the "Horseshoe," you were to turn into Endell Street, and take Covent Garden on your way, it would be nearer. But then the yellow 'buses from the "Mother Redcap" don't pass that way, and the driver is obliged to go by his usual route, whether you are bound for the Sahara, or St. Martin's Lane. So there is no use grumbling; I pay my twopence at St. Martin's Church like a philosopher, and walk the rest of the way.

Charing Cross. The luggage porter takes a long time looking through the little volume I hand him when he asks me for my ticket. I have begged him to label my bag for Marseilles, and he is now deeply interested in the book of travel they have given me at the booking-office in exchange for £17 18s. "Where is the Girdle Railway coupon?" he presently asks. I am sure I don't know. I should have thought the thick little volume of tickets would have satisfied any reasonable porter, for they are there in English, French, and Spanish. So, after looking over the porter's shoulder for a while, I hazard that it may be among the Spanish sheets. But he is not satisfied, and as he labels the luggage, suggests all sorts of difficulties for me later on.

Out into a London mist across the river we go, our train rather uncertain of its way at first, evidently, for it slows, and halts, and backs at times. But this is only while we are still among the fog and the chimney-pots. By the time we reach New Cross the carriages are spinning along at high speed, and green-turfed Chislehurst and leafy Sevenoaks are past and away before there is well time to settle down to the morning paper.

Bad news from Egypt again! And the Queen's speech as uninteresting as ever. Short disjointed paragraphs Her Majesty adopts, in order to make the stale news she tells us look tempting. Bah! What's the good of saying Gordon has gone to Khartoum, and that the Madagascar difficulty with the French is as good as over? I should think so, indeed. Why, it all happened last year.

Dover. Two sudden dips into darkness under Shakespear's Cliff, and we are on the Admiralty Pier, with the fretful waves washing as restlessly as ever against the granite sea-wall. "The Calais boat opposite; Ostend further on!" shout the men in blue jerseys worked with red; and so we go opposite and down a steeply inclined gangway all wet and slippery with recent swabbing.

A close paint smell in the cabin, as usual. A well-cut ham and plenty of brandy-and-water seem to be the only refreshments, although it is true there are some smart pints of champagne—all gold and white labels—on the table too, but nobody ever touches them. Somehow I never care for high living on board a steamer. I am not a bad sailor, of course—nobody is; but I always prefer to munch a dry biscuit, and to lie down on a couch, if I can. It is a habit I have, that I have acquired by something inside generally telling me it is the best thing I can do.

We are getting on. This black structure of tarred planks, that rises from the low stretch of yellow sand, is Calais harbour, and in ten minutes more our swift steamer, with its sloping white funnels, is running between the high black piles on either side. There is the same crushing, rugs and parcels in hand, to get ashore; the same rush, as of old, across to the line of carriages; the same hoisting and pushing into the comfortably stuffed drab-lined coaches of the Chemin de Fer du Nord.

"Vingt-cinq minutes d'arrêt!" shouts the white-aproned garçon, with a view to induce you to descend. "Twenti-faive meenets!" he adds, when you shake your head; and then, to make the matter quite clear, he rubs a big 25 on the glass with his fingers. At this, as I am getting up my Spanish, I venture, "Habla Espagnol?" doubtfully; he looks up, walks away sulkily, slamming the door after him. The waiter's disgust does not, however, so much matter just now, for as soon as the train starts, one of my friends unpacks a fowl, while I get out my ham sandwiches, and these, with a "demi" of Burgundy, which I had taken the precaution to purchase on passing through the buffet, make up a splendid banquet that we thoroughly enjoy after our sea trip.

And now I am well on the way, I ought to say a few words about my outfit. There is plenty of room here in the comfortable railway carriage for examining it all, and plenty of time, too, before we get to Marseilles to-morrow morning at ten. I have got my camera in a little waterproof case in the netting overhead, so we will have it down to look at. Here it is lying on the cushion, a brand-new half-plate apparatus of shining mahogany and well-polished brass fittings. The fact is, I was rather afraid of my ancient experiences, and have left behind my two little cameras that served me so well in my knapsack journies a dozen or fifteen years ago. One of them weighed 1½ lbs., and the other 2¼ lbs., but they only took 5 by 4 plates; still I have some misgivings about weight and bulk, and, as I look at my shining friend on the seat opposite, I am beginning to think whether I should not have done better to have been a little more modest.

The fact is, the term "tourist photographer" wants to be better defined. I am a tourist photographer, I take it, and as such, thought I, I cannot do better than go to one of the best manufacturers and purchase a "tourist camera." There are several advertisers in the Year-Book, so to the Year-Book I turned for information. There was not much choice as to price or to weight, I found, so a decision was soon arrived at. I have carried a camera into most countries of Europe—to Norway in the North, and Italy in the South—but my last trip was five years ago, before gelatine plates were in every-day use. So, in a way, I am quite a novice as "tourist-photographer," and in these circumstances it behoves one to be humble and to take advice. I have taken it, and hence, apparently, my somewhat uncomfortable position.

Yet stay; I must plead guilty to being obstinate on one point. It is this. My half-plate camera being a "tourist-camera," must, perforce, be all right, and though it weighs no less than four pounds and a-half, and is furnished with as many as seventeen catches and screws of one kind and another, there was nothing for it but to submit. But the case, being a mere article of packing, I was not bound to carry, and so I have left it behind. "I want a mere cover of waterproof canvas with flaps," was my demand, and in satisfaction of this, there was sent home a stout leather cart-horse like equipment with heavy canvas sides, weighing 3 lbs. 3 oz. A friend told me, just before starting, that this sort of cast-iron portmanteau might be useful, after all, in case the camera got kicked

about. But then, I do not mean to kick it about, but to carry it, very carefully; so I have put the apparatus in a thin waterproof-cover, weighing three ounces, and this, rolled up in my overcoat and slung in a coat-strap, will satisfy me. The three pounds of portmanteau my friend will be quite welcome to if he will accept them.

But as to the definition of a "tourist photographer." I don't know if I am right, but my idea of him is this: that he is somebody out for a holiday, and carries a camera with him, much as he would a note-book or album; he wants to have a pleasant trip or tour, and bring home pictorial notes or sketches of that tour. That is my object on the present occasion, and that is why I call myself a tourist photographer. A pleasant holiday is my first aim; to bring home reminiscences of it is the second. Therefore, the photographic apparatus must be subordinated altogether to the pleasuring, and this is not the case if the tourist is a slave to his camera, and is overburdened by his outfit. Of course, if the object were to make the journey a paying concern by means of photography, or if, as amateur, the chief aim were to secure a complete set of views of value from a geographical or artistic standpoint, it would be another matter altogether, and then you would be a travelling photographer more than anything else. The two things, I hold, are quite distinct, and it is because I choose to be the more modest of the two, I do not want to carry an unnecessary burden.

One moment. Here is Paris, with its tall white buildings growing up around us, the acres of whitewash occasionally varied by structures of pale green. Legends in big black letters are written everywhere about the Bon Diable, and the Magasin du Louvre, and Café Estaminet, and Défense d'afficher. But I am not going into Paris, but around the city by the Girdle Railway, about which my friend the porter at Charing Cross was so anxious. It is a long way round, by-the-bye, to the Lyons terminus, but once here, if you have your wits about you, there is a capital dinner to be got, with three-quarters of an hour to eat it in.

But to resume what I was saying about the tourist photographer. Supposing he is satisfied to work with a half-plate camera, I contend that he ought to be able to get an apparatus weighing less than mine does, viz., 4½ lbs. without lens or dark slides. The diligences in Algeria limit the traveller's luggage to 35 lbs., and yet my photographic outfit, restricted as it is, comes to two-thirds of this weight.

Here are the items:—

	lbs.	ozs.
Camera	4	8
Rubber case	0	3
Stand and top	2	2
Three dark-slides (double) ...	1	14
Lens, shutter, and cloth... ...	1	0
Six dozen plates (thin glass) ...	15	0
Divers	0	7
	25	2

My camera, it is true, is not only stout and firm and excellently made, but is capable of being fitted with half-a-dozen lenses of different focus, can be employed for copying, and has every appliance that the most refined photographer desires. But I would willingly dispense with the ability of a tourist-camera to be used for copying, if a pound or pound and a-half of its weight were struck off; and I cannot help thinking most bona fide tourists would say the same. Unless some Arab in the Great Sahara—by-the-bye, this Sahara is a long way off at present, but I suppose if the train goes rattling on in this way for a bit longer, shaking your bones like an unstrapped tripod, I shall soon come within measurable distance of it—I say unless some Arab in the desert should bring a faded carte of his mother-in-law or something of the sort, and express a fervid desire for a few copies, I do not quite see of what use the copying arrangement will be to me. In a word, the so-called tourist camera of to-day seems to me a most delightful, ingenious, and well-constructed instrument, and to be pre-eminently suited for every purpose in the world except that of a tourist photographer.

But it is time for bed now. We left Macon behind an hour ago, and the rattle and din of a P.L.M. carriage is apt to make you sleepy after a ride of a dozen hours. My companions are already in a state of torpor in different corners of the carriage, snugly ensconced against the softly-padded cushions, and twisted up into unshapely masses in their shawls and rugs. Dozing is easy under these circumstances, and it is only when the train comes to a full stop, and strange nasal shouts are heard through the still night that you get awakened. On we go again—on—on—until I begin to see picturesque Arabs around, and palm trees, and the Great Saha . . . . .

No, that big station with the lights was Lyons. I rub the glass and look out at the fierce moustached officials hurrying to and fro in the chill morning air. The last time I was in Lyons I remember was in 1858, when on my first visit to Switzerland, and now I am off to the Great Saha . . . .

By Jove! how bright the daylight is, as it comes in beating in upon us all drowsy, begrimed, and unwashed. That broad river must be the Rhone, hurrying on its way, like ourselves, to Marseilles; and soon afterwards on the left there is a glimpse of the Mediterranean.

Marseilles at last. Eight hundred miles is not bad travelling for the first day. I get together my rugs and parcels, and make ready for the Custom's examination. I shall have to pass my packets of dry plates, done up in half-dozens, and lying perdus in certain articles of apparel in my Gladstone bag. By-the-bye, I want to say something about packing dry plates; the fact is, that you can *say* a good deal, but *do* very little with them, when it comes to packing. I mean that you can't get out of it that they really are heavy and bulky. Now I don't think—"Messieurs à la douane, s'il vous plait."

Pray excuse me finishing just now. The boat for Philippeville starts at 5 p.m., and as soon as I am on board I will proceed.

ON THE VALUE OF DIAPHRAGMS IN PHOTOGRAPHIC LENSES.

BY DR. SCOTT.*

MANY an amateur, on commencing landscape work, is troubled by the various stops applied to the lens he possesses not bearing any definite relation to the fixed aperture of the lens, so that even if he knows the rule to square the exposure for each decrease in size of the stop, he is still in trouble on account of the numbers on them not having any definite relation; and further, if he tries to use another lens after having got used to his own, he is rather worse off than before, for a time at least. All photographers know that different lenses possess different rapidities, but yet this difference is more apparent than real, the whole difference lying in the stops.

In order to define accurately the size of a diaphragm used in any lens, a formula is generally given for it, it being generally written as an italic "f" divided by some number; for example, $\frac{f}{}$. This simply means, assuming that "f" means "focus," the length of the focus of the lens divided by some figure that will give the size of the stop.

Thus, if we have a lens of eight inches focus, and find by measurement that the largest stop be half-an-inch, on dividing the latter into the former, we get 16 as a result. Now write this as $\frac{f}{16}$, and we have the exact relation of the stop to the focal length. If another stop measures quarter-inch, the resulting fraction will stand $\frac{f}{32}$. By this simple means we see at once that the latter stop is one-half the size of the former, and that it will require four times the exposure. Again, should it be necessary to have two different lenses in use, as it may not always be possible to have them of the same class—a short focus symmetrical, and a long focus single landscape lens, for example—some means of comparing the rates of exposure should be at hand. In two

* Abstract of a Paper read before the Photographic Society of Ireland.

such lenses at present in my possession, I find that the full aperture of the single lens is $\frac{f}{13}$, while that of the symmetrical lens is $\frac{f}{15}$. On squaring these, the relation stands pretty near as 1 is to 1½, so that the latter lens requires an increase of exposure in that ratio. From this we see that all lenses possess the same rapidity, *provided the stops bear the same relation to the focus:* the great difference in the rapid lenses over the slow ones being that they can work with much larger aperture.

In order to equalize the various makers' lenses, the Photographic Society of Great Britain have recommended what is termed a "uniform system" of numbering the stops. They recommend that all stops having the formula $\frac{f}{x}$ be stamped with the figure 1, this being the largest aperture that it is at present possible to make, and every other stop with that number which would indicate the exposure in comparison with the standard $\frac{f}{4}$, without regard whether all the stops can be found in the lens or not. The figures would run thus:—

$\frac{f}{4}$	$\frac{f}{5{\cdot}6}$	$\frac{f}{8}$	$\frac{f}{11{\cdot}3}$	$\frac{f}{16}$	$\frac{f}{22{\cdot}6}$	$\frac{f}{32}$	$\frac{f}{45}$	$\frac{f}{64}$
1	2	4	8	16	32	64	128	256

The intermediate ones by calculated in proportion. If this was carried out by all makers, no matter what lens we took up, the exact rapidity could be seen at a glance.

I calculate the formula of the various stops in the lens, and select three or four of those that bear a direct proportion to each other, so that the exposure may be, say, the middle stop, four times the full aperture, and the small one four times the middle, and consequently sixteen times the full aperture.

COPYRIGHT LAW IN BRIEF.

COPYRIGHT means the sole and exclusive right to copy, reproduce, and multiply, by any means, and in any manner, any original painting, drawing, photograph, or other work of art.

Copyright accrues to the *author* of a work of art, by virtue of authorship, and lasts for his or her natural life, and seven years after death.

As soon as the copyright in any work is registered, in accordance with the provisions of the Act of Parliament known as Vic. 25 and 26, cap. 68, it becomes personal estate, and can be sold, assigned, or demised, just the same as any other personal estate.

A properly registered copyright will enable the owner to take proceedings and recover penalties against any one who, without permission, copies or imitates, wholly or partially, the whole or any portion of the original work of art to which such copyright applies.

Under the Copyright Act, an original negative, or the photographic copy of it, is considered a work of art.

A photographer can make a negative of a landscape, of natural objects, of architecture; in short, of any object or objects in which there is no copyright, and the correct registration, according to the Act, will secure to him his copyright in that particular negative or photograph. He cannot, however, prevent any other person making another negative of the same objects, even from the same point of view, and as nearly as possible under the same circumstances.

If a photographer take the portrait of a person of eminence—a member of the Royal Family, musician, actor, &c., &c.—copyright can only be secured by a signed agreement, made at or before the time of sitting, between the person whose portrait is made, and the person who makes the negative. If this be not done, and the names of the parties to the agreement properly filled up in the registration form, there will be no copyright.

If a *group* of persons be taken, it will be necessary to have the signature of every member of the group to the agreement.

Seeing that copyright accrues only to the *author* of the work, a principal cannot send out his operator to execute his commission, and then take the copyright to himself; it will, in every case, accrue to the author of the work.

In the present state of the law, it would seem to be absolutely necessary, that, where a principal does not himself execute the work, or have it done under his personal direction and supervision, he must have an assignment of the copyright from the person he employs, and who, in the eye of the law, is the true author.

Portraits taken in the ordinary way of business have no copyright, except by special agreement; but that does not give the right to the photographer to print from the negative for his own purposes. He is bound to use the negative, if he retains it, only to the order of his employer.

The owner of a copyright picture cannot have it reproduced or copied unless he *also* possesses the copyright.

Authors of original works should secure copyright by registration as early as possible; illicit copying of an original work before the copyright is registered is actionable, and confers no copyright.

In transfers of photographic businesses, each copyright negative must be duly assigned, and the assignment registered at Stationers' Hall; unless this is done, the purchaser of the business does not acquire the copyrights.

Proper copyright forms can be obtained for one penny each at Stationers' Hall.

The penalties for infringement are very heavy, the offender upon conviction being liable to be adjudged to forfeit a sum not exceeding ten pounds for every copy sold, or offered for sale.—*Autotype Notes.*

Patent Intelligence.

Applications for Provisional Protection.

2767. FREDERICK WOODWARD BRANSON, of Leeds, in the county of York, Pharmaceutical Chemist, for an invention of "Improvements in photographic 'shutters.'"—Dated Feb. 5, 1884

2981. WALTER BENTLEY WOODBURY, of South Norwood, in the county of Surrey, for the invention for "Improvements in methods for producing printing-blocks by means of photography."—Dated 8th February, 1884.

2987. ALBERTA MARY FRANCES CASPAR, of 200, Regent Street, in the county of Middlesex, W., Artist and Inventor of Easy Artistic Processes, for an invention for "The easy copying and toning of photographic and other prints."—Dated 8th February, 1884.

3017. JOSEPH NORRIS, of Birmingham, in the county of Warwick, for an invention for "Improvements in the manufacture of ornamental building slabs or tiles."—Dated 9th February, 1884.

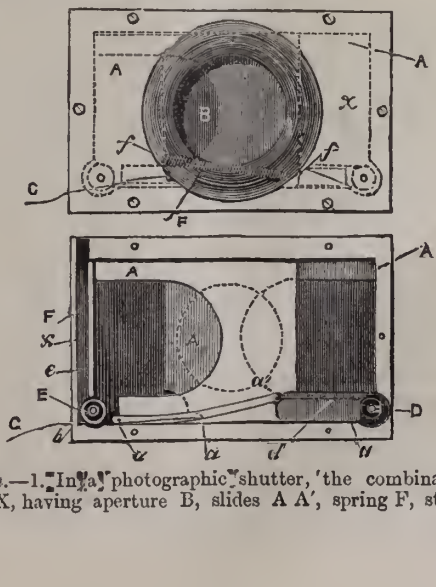
3026. JOHN and ALFRED GEORGE HOPKINS, of Amwell Cottage, Hoddesdon, in the county of Herts, Photographers, for an invention for "A new apparatus for the exposing of photographic sensitive plates in cameras."—(Complete Specification)—Dated 9th February, 1884.

Patent Sealed.

3948. JOSEPH JULIUS SACHS, of 8, Union Court, Old Broad Street, in the city of London, for an invention of "Improvements in the manufacture of pliable plates and surfaces as a substitute for glass for photographic and other purposes."—A communication to him from Messieurs Fickeissen and Becker, resident at Villingen, Baden, Germany.—Dated Aug. 14, 1883.

Patent Granted in America.

92,707. DEXTER B. SWEET, Eaglewood, Ill., "Photographic Shutter."—Filed Nov. 9, 1883. (No model).



Claim.—1. In a photographic shutter, the combination of frame X, having aperture B, slides A A', spring F, studs *f f*,

cord C, cord *d*, and wheel or pulley D, all arranged, operated, and controlled substantially as described, and for the purpose specified.

2. In a photographic shutter, frame X, having aperture B, and slides A A', in combination with spring F, cord *e*, pulley or wheel E, cord *d*, pulley or wheel D, and cord C, all substantially as described, and for the purpose specified.

A Dictionary of Photography.

ALBUMENIZED PAPER (Printing on).—*Continued.*

Burnishing, enamelling, &c.—We mentioned that the object of rolling is to produce an even and polished surface on the photograph. The burnisher acts in a somewhat similar manner to the hot rolling press, but in skilled hands it is capable of producing a more brilliant surface and better tones. The principle of the

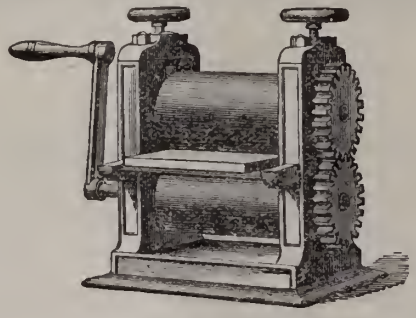


Fig. 6.

burnisher differs only from the hot rolling-press, inasmuch as the print is dragged by a roughened roller over a highly polished and hardened steel bar, which is stationary and heated, instead of passing between two polished steel rollers, or a steel bed and roller, as in fig. 6. Fig. 7 is a sketch of an ordinary burnisher.

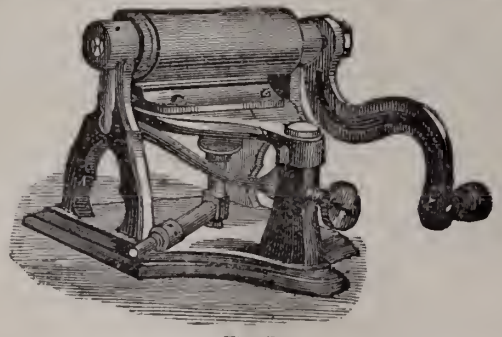


Fig. 7.

To ensure success with the burnisher, it is necessary to lubricate the photograph, and there are several ways of doing this; perhaps the highest degree of polish is obtained with curd soap rubbed on in the dry state by means of a flannel pad. Some prefer using an alcoholic solution of soap made by dissolving sixty grains of curd soap in a small quantity of water, adding methylated spirit to make twenty ounces. Moisten a tuft of cotton-wool with the soap spirit, and rub the surface of the photograph on every part; five minutes afterwards it may be passed through the hot burnisher, care being exercised not to scorch the photograph, or make a halt while it is passing over the heated bar. Care is also necessary to prevent particles of dust entering between the bar and the photograph, as scratches would be produced on the subsequent prints; should this happen, the burnishing tool should be rubbed on an oil stone, with a little powdered emery, finishing on an emery knifeboard to bring up the polish. As many persons object to using soap in any form on the photograph, they will find a very good substitute in wax. The following has been lately recommended as one of the photographic societies, and we have found that it answers well:—

Benzoline spirit	1 pint
Paraffin wax	20 grains

Among other modes of obtaining glazed surfaces on photographs besides rolling and burnishing, so-called enamelling must be mentioned, the finished result giving a very fine glaze, as highly polished as a glass plate. The process consists in placing the albumenized surface of a photograph, in a moist condition, in contact with a polished glass plate, which has received a coating of normal collodion, and a somewhat dilute solution of gelatine; when dry, the print will drop off. For the information of those of our readers who have never tried the process, we will describe the operations:—

Transparent gelatine	1 ounce
Water	8 ounces

soak one hour, then add—

Glycerine	10 drops

heat on a water bath until the gelatine is dissolved; filter while hot.

Normal Collodion.

Pyroxyline	2 drachms
Methylated ether...	8 ounces
Methylated alcohol	2 ,,

These proportions may be altered to suit the cotton used. Mount the photographs by means of gelatine, as above, on thin cardboard; what is known as Bristol board being very suitable. When quite dry, touch out any white spots which may be caused by dust during printing, or faults in the negative, afterwards placing them in a dish of cold water to soften the board. This will take place in about ten minutes, more or less. The prints should remain until quite soft, as success depends in a great measure on their pliability at this stage. The time that elapses while the mounted prints are drying may be occupied in preparing the plates. Patent plate free from imperfections should be cleaned with dilute nitric acid, well washed, and polished with tripoli, or any of the substances usually employed for plate cleaning; powdered French chalk (talc) is dusted on the surface, and removed with the polishing cloth. Pass a camel-hair brush over the plates to remove any particles of dust, then coat them with normal collodion in the same manner as coating a wet plate or varnishing a negative; when set, rear on end to dry. A number of plates may be coated, as they will be none the worse for keeping. We will suppose the mounted photographs have been soaked as directed, and are soft; remove them from the dish of water to a clean damp cloth; blot off the excess of water, and leave them in the cloth until they are required for the next operation.

The gelatine should be re-melted in a flat porcelain dish over a water bath; into the solution immerse one of the dry collodion plates, and one of the photographs from the damp cloth. To bring these two into perfect contact requires a little skill and practice. From our description, however, it should not be found at all difficult. With the left hand hold the plate, collodion side uppermost, just under the surface of the solution; with the right hand lower the print gradually on to the plate, commencing at the bottom and working upwards. The top of the print should be held outwards, so as to form a slight curve; by this means it will be easy to see the air-bells gradually pushed out as the two surfaces come in contact. Having accomplished this satisfactorily, lay the plate down on the bench, and well squeegee the back of the photograph to remove any excess of air and gelatine imprisoned in the paper. When all the prints have been squeegeed down on their respective plates, place them in a current of dry air, and leave them for twelve hours; at the end of that period the prints probably have dropped off the plates; if not, they will come away quite easily if the point of a penknife is passed round the outer edges to give them a start. It is not usual for photographers to deliver these so-called enamelled photographs to their clients in this condition; they are generally stamped up by an embossing press. The margin, after being reduced to the required size (prints intended for enamelling need not be cut until after they leave the glass plate), is fastened with glue to an ordinary thick card mount. When cabinet or larger sizes are produced, the air space between the embossing and the ordinary mount should be filled with cotton wool padding, to prevent the centre falling in by reason of changes in the atmosphere. It will be seen that the highest degree of finish can be obtained by this method. Pictures printed as cameo vignettes, medallions, and cushion-shapes with printed-in margin, as described in a former lesson, are particularly suited to this class of work. Fig. 7 is a sketch of an embossing press. The print is adjusted so that when the pressure is exerted, the metal die fits exactly over the mask line selected in printing; that is to say, an oval used in printing should be of the same dimensions as the die of the em-

bossing press. Do not apply too much pressure, and immediately remove the print, for unless the cardboard be of unusually good quality, it will in all probability burst. Many inexperienced persons fall into error in this particular, and throw the blame on the press or the cardboard. To avoid such failures, allow the print to remain under less pressure for a longer period, say one or two minutes.

(*To be continued*).

SHORTCOMINGS OF PHOTOGRAPHY.

BY DR. TULLOCH.*

In photography, where so much depends upon manipulations and processes, technicalities require, and do actually receive, great attention. The vast majority of papers read, and discussions held at photographic society meetings, are upon technical matters; and while a great deal has to be done yet before our formulæ can be considered perfect, or apparatus all that could be wished for, I think the time would be well spent were we to leave these well-worn grooves occasionally, and, taking a broader view of the situation, consider in what precise direction improvement is most urgently required. This idea was forced upon me the other day, when, having the opportunity of comparing a photographic landscape with an engraving taken from the very same spot, I had to confess that the photograph lacked in a woeful degree the breadth and fine pictorial quality of the engraving. Nor was this due to any liberties which the artist had taken to improve his picture at the expense of truth, as could easily be seen by referring to the photograph. What, then, constituted the difference, and why was there a fine breadth of effect in the engraving, and a particular absence of it in the photograph, when, in both cases, the very same subject had been chosen.

In the following remarks I shall give what appear to me to be the principal shortcomings in a photographic picture, and as the subject is both wide and difficult, I make no pretension to do more than skim the surface. To be concise, and at the same time intelligible, I will consider the subject—1st, as to outline; 2nd, as to light and shade; and 3rd, as to colour.

1st, as to outline. A design, whatever it may be, is forcible in proportion as it is simple. An artist secures breadth by seizing the salient points and presenting them unbroken by paltry detail. For this reason, the photographic outline is too complex to be effective. It must be remembered that, while it is so far a copy of nature, it is a very diminutive copy, and will not bear the same elaboration as the original. Besides, seeing that objects in very different planes have to be adequately represented on the flat as being at different distances, some plan must be fallen upon to do this. One of the most important aids in this direction, is the suppressing of outline here and there, and the simplification of it where it cannot be suppressed. In this way, a foreground may be made to come forward, while the distance seems to retire. Of course, the camera has no such modifying power, and although we often see in the photographic picture an outline which would be better softened, or another accentuated, we have no way of photographically effecting it.

This equally intricate outline over the whole length and breadth of the picture not only destroys distance, but it is not a correct representation of what we see, for it will be found, if the eye be fixed upon a certain object, that the outline grows less and less intricate as it nears the margin of our view. Looking along an avenue of trees, for instance, with our eyes fixed upon a certain point, although we have a vague, general impression of the trees immediately on our right-hand and our left, we do not distinguish every leaf and every little spray as the photographic lens reproduces them. If the eye were in focus at one and the same time upon an object a few feet in advance, and upon another half-a-mile away, our perception of distance would not be nearly so perfect as it is, and yet, depth of focus in a lens is considered a very important feature.

It may be asked, then, if our pictures ought to be blunt or blurred towards the margins? By no means. The impression which the eye receives of objects not precisely at the point of sight, is not a blurred image. The general impression of outline is perfectly sharp, but the eye cannot follow it in all its little tortuosities. If an artist would be successful in conveying the impression which a certain scene had upon him, he must manage to bring the eye to rest upon his canvas precisely where his own rested when the original impression was produced. He does this by carefully working up from simple forms at the margin, to the most complex at the point of sight. In this way the eye is carried forward to the focus of the picture, and finally chooses as a centre the very spot which was the centre of his own impression. I cannot see how the photographic outline, which is as pointed and precise at the margin as in the very eye of the picture, can lead one on into the distance; rather, I should say, is the attention arrested and fixed by what should have been only a stepping stone. The point of maximum interest is never at the margins of my field of vision, and yet I have frequently seen it here in photographs. Vignettes have always been considered the most artistic of photographic productions, and this, I am convinced, simply because the margins are robbed of their undue importance. To recapitulate, then, I consider that the photographic outline, being equally intricate throughout, by scattering the interest, robs the picture of the charm and force of one common centre.

(*To be continued.*)

* Read before the Dundee and East of Scotland Photographic Association.

Notes.

A satisfactory balance sheet, and a notable increment in the membership roll, are good indications of the prosperity of the Photographic Society of Great Britain.

The general work of the Society during the past year, as reported at the annual meeting on Tuesday, has not been characterised by any striking innovations, but by steady progress. The Society's Official Journal, under the management of Captain Abney, has cost some £14 less than last year, and some useful pieces of property have been acquired.

Our readers will see by the abstracted report, which we print in another column, that Col. Stuart Wortley becomes a Vice-President, and Prof. Donkin takes the office of Hon. Secretary, while two new names will now find a place in the list of Members of Council.

It is passing strange, to some of us, to hear contemporaries of Daguerre speak of him and his invention when some thirty-three years ago the world was startled with the marvels of Daguerreotype. Our friend Mr. J. E. Mayall, of New Bond Street, was one of the few who depicted the great Frenchman in the camera, and this photograph, our readers will remember, forms the frontispiece to the Year-Book of 1881. But Mr. Mayall's personal experiences are as nothing compared to those of the venerable Secretary of the French Academy of Sciences, for M. Dumas remembered Daguerre in 1827, twelve years before Daguerreotype was known to the world.

"I was a young man then," is M. Dumas' story—M. Dumas, we may mention, was born in the same year as the century—"and must have been about 27, when a message was sent into my laboratory that somebody wished to see me. I asked the visitor in. It was Madame Daguerre. She came to consult me on the subject of her husband's investigations. So far, he had been unsuccessful, and she did not conceal the anxiety under which she laboured. 'Was there any chance of the dream of her husband ever being realised?' she desired to know

'or whether,' she added timidly, 'it would not be well to wean him from them, before it was too late?'' In a word, Madame Daguerre was of opinion that her husband was going mad. Dumas hastily reassured the wife, and soon afterwards, says the venerable chemist, "I had the satisfaction of knowing that I had not been mistaken; Daguerre discovered the solution of the problem he had been searching—a discovery that made him famous." Thus the *Revue Photographique*.

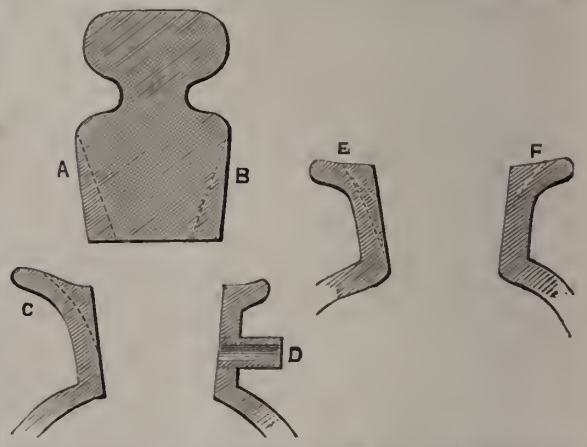
The unfinished appearance so often noticeable in the case of cartes or other portraits coming from the studio of the amateur is mainly due to the circumstance that the mounts are ordinarily blank ones; such, indeed, as no professional photographer would use. As an exception to this usual order of things, we may mention that an amateur photographer, who is a large chemical manufacturer in the north of England, recently sent us some cartes which were on mounts imprinted in quite the business style, there being a place for the number of the picture, and an announcement that enlargements could be satisfactorily made from the negative. The principal line, however, was "Amateur Photographer," not "Artistic Photographer."

Fancy balls and fancy bazaars are great boons to photographers. All the ladies who took part in the Peasant Festival at the Albert Hall this week were previously photographed in the costumes in which they were to appear, and the collection promises to be a very interesting one. Messrs. Elliot and Fry were the photographers.

Photographers who go in for "Club" portraits would do well to be suspicious of over-energetic canvassers. Messrs. Taylor, of Brighton, have, within the last few days, been compelled to prosecute a person in their employ; the circumstances indicating that the "Club" system has to be conducted with great caution to avoid the possibility of fraud. The custom at Messrs. Taylor's establishment was for the canvassers to pay over two shillings on each order, they receiving in return the full commission of fifteen per cent. on the amount of the order. The person in question entered upon his duties in June last, but after a time suspicion began to be excited by the immense number of orders he obtained; and it was afterwards discovered that a large number of addresses in his book were wrong, about £21 having then been paid to him in commission. In the case selected, the prosecution broke down, as it was elicited that the prisoner had repaid by instalments all that was due in this particular instance. It is stated, however, that there were numerous other charges, and the prisoner was remanded on bail.

As the case is still *sub judice*, comment upon it can scarcely be made; but there is a point to which attention may be drawn, as it illustrates one serious difficulty of the club system, namely, the collection of the instalments. A circumstance noticed by Messrs. Taylor was that in the order book of the accused his own address was put down as being the address of several customers. When asked to explain this, he said these customers did not wish to be called upon by canvassers, and he had therefore thought it best to insert his own address instead of theirs, and this explanation was believed. But that it was so, leads to the inference that the firm was aware of the sensitiveness of the public in regard to belonging to photographic portrait clubs. It would be instructive to have the experience in this matter of those who had much to do with clubs, and to learn how the difficulty is best got over.

From Germany we receive an ingenious dropping bottle. In the stopper are filed two grooves, A and B, these grooves extending rather more than half way up. When the stopper is so placed in the neck that one groove corresponds to the lip C, and the other groove to the vent pipe D, it is easy to pour the liquid out in drops; but when



the stopper is turned round a quarter of a circle, the bottle is perfectly closed. We find that an equally efficient apparatus can be made from an ordinary bottle by filing grooves in the stopper as described, and in the neck as shown at E and F. An ordinary rats-tail file, moistened with oil of turpentine, answers well.

Science in the purple has taken the place of the starving alchemist of old. The late Sir William Siemens, who had not many shillings when he came to England thirty years ago, has left property to the value of almost half a million, his personality alone being valued at £380,000. For one scientific man in the last generation whose income was three or four thousand a year, there are a hundred to-day who make as much out of scientific advice and scientific teaching. In the days of Sir Humphrey Davy, and even Faraday, there was, indeed, no such thing as earning a fortune by science, and although the old alchemist was for ever trying to make gold, he never succeeded. Nor was teaching considered a lucrative profession fifty years ago; yet to-day professors may be found in the Scotch and English capitals who, in return for an average of two or three hours' tuition a week, receive an income amounting to thousands of pounds.

The salaries of official scientific men are, certainly, none too high, when we compare them to those enjoyed by other

professions. At the same time, it must be remembered that Government rarely absorbs the whole of a man's time, so that his official salary is usually but a portion of his income. Among the "plums," may be classed the Professorship of Chemistry at South Kensington, held by Dr. Frankland, which is worth £1,609; the Inspectorship of Fisheries and Professorship of Biology brings in the holder £1,500; the Chemist of the Mint, with a second appointment, receives £1,125, while a round thousand each is the value of such appointments as Astronomer-Royal, Chemist to Inland Revenue, Inspector of Explosives, Chief Mining Inspector and Professor of Metallurgy, at Kensington, &c., &c. Be these gentlemen well or ill paid, there were no such lucrative appointments open to scientific men of the last generation.

A contributor, wishing to hire a suitable place for gelatino-bromide experiments, advertised in the *Daily Telegraph* for a dry cellar near Charing Cross, no window necessary. A well-dressed man, whose awkward manner and unready answers at once proclaimed him a detective, called on our friend and said he had such a cellar, but in response to the natural enquiry as to its whereabouts he seemed confused, and ultimately gave a fictitious address. He proved to be one of the new "dynamite staff" of Scotland Yard. If this officer will only take the trouble to revisit our friend's chambers in the Adelphi, he will not only find there abundance of all such materials as are used in making dynamite, but also several very strangely devised pieces of clockwork. At our own laboratory, also, he might find in addition to these, everything required for making bad coin and forging bank notes; and, what looks even more questionable, a full-sized reproduction of the bank note watermark, made by the photo-filigrane method of Mr. Woodbury."

CHAPTERS ON LANDSCAPE AND OUT-DOOR PHOTOGRAPHY.

BY H. P. ROBINSON.

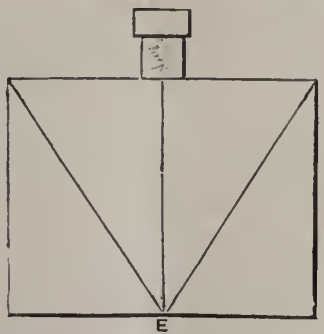
No. 6.—On Sea and Shore.

Before the advent of gelatine plates, photographs of the sea were the unfulfilled dream, rather than the accomplishment, of the photographer. It is true that some very creditable results were produced (chiefly by the aid of double printing), especially for the stereoscope, and, in a few instances, of larger sizes; but nothing to be compared with the marvellous achievements that are now open to the followers of our art.

But with the sea, now we have the means of photographing it, we are doing to-day almost exactly what the earliest photographers did with landscape; we are content to take almost anything that presents itself to us, and think it good if it is sharp. The possibility to get the tumultuous waves in so short a time that they appear in the print to have been quite still, is such a surprise that many photographers appear to be quite satisfied with it, and the simple pleasure of surprise is enough for some people, bearing out the adage "little things please little minds;" but when the novelty of quickness wears off, they will find there is a good deal more to be done than has yet been accomplished. At present there is too much disposition to rely on accident. A photographer will go down to the sea and fire off some dozens of plates in the hope that a few of them will turn out prizes. This is photographing with the hope of a miracle happening, which I need not say is not art.

In producing plates quick enough to receive the ever-changing, restless sea with ease and certainty, the photographer has had placed in his hands weapons with which he may conquer a new realm. And this addition to his conquests will be fortunately more appreciated in our country than any other, for Englishmen love the sea, and are never happier than when on its surface or its shores. Subjects are more plentiful on sea and shore than in other places. Nearly my first experience with gelatine plates was on the sea, during a yachting cruise on the Clyde and among the Western Islands of Scotland.

Plates and shutters have greatly improved since that time, but I was astonished at the wonderful ease with which good negatives could be got even on the unstable base of a yacht in full sail. One of the difficulties was to get the horizon even approximately level. The roll of the boat was not of much consequence, but the pitch, if it happens at the moment of exposure, was often fatal. Recent experiments have convinced me that this difficulty can be modified by using a camera stand with a ball-and-socket joint, with the camera loosely fixed, so that it can be turned about quickly by the hand. With this arrangement, and a finder, combined with a pneumatic exposer, many difficulties disappear. A finder is of great use, for without one the photographer may discover that a vessel has escaped from the field of the picture altogether, or left only her mizen behind her, like little Bopeep's sheep. There are several good finders sold now, but they are most of them too elaborate for my use. I like every piece of apparatus to be as simple as I can get it, and am even prepared to give up some advantages to attain simplicity. The following plan I find to answer sufficiently, and it is always at hand, and never requires separate setting up. The ground glass of my camera is hinged, and, when the slide is in, falls flat on the top. On the glass are drawn three lines, one directly down the centre, the other two



from E to the opposite corners. When the glass is flat on the camera, by placing the eye at E and looking along the central line, as you would along a gun-barrel, you get the centre of the picture, and by looking down the diagonal lines, you find how much will be included in the angle of view. The diagonal lines must be adjusted to the focus of the lens you are using,—and this reminds me that a long focus lens is better for a sea-view than a wide-angle. There are two or three things worth considering in taking ships at sea. I quite believe that all things are possible now-a-days, but some are easier than others. A ship going broadside on is more liable to show movement than one coming end on. The cause of this is plain. If a vessel is going parallel with you, it infinitely more quickly exposes fresh sky behind it than does a ship that is coming towards or going from you. The latter covers the same space for a much longer time than the former, and allows a more prolonged exposure. It is for this reason that photographs of railway trains going at full speed have been so easy,—they are all taken end on. A vessel sailing in the same direction as yourself will allow of a

longer exposure than one that is meeting you, and objects on the deck of the vessel on which your camera is placed will allow of very prolonged exposure even when the boat is rolling considerably, always making allowance for the jerking of the rigging. It will be found that camera, vessel, and all the objects on it roll together, and, other things being equal, have no effect on the definition. The extraordinary photographs of yachts exhibited at the last exhibition of the Photographic Society by Mr. West, of Gosport, showed that marvellous results could be attained. The majority of these pictures were taken while racing from another vessel. There must have been, of course, many failures in taking these pictures, but much as I object to "flukes," when a photographer produces some hundreds of such pictures as these in a season, as I believe Mr. West has done, I cannot put down his success entirely to accident.

But it is on and from the shore that the photographer ought to expect to find his best subjects. Life on the shore is full of pictures. The sailors and their occupations afford plenty of incidents, while the sands and shingle and cliffs supply picturesque surrounding. There is only one aspect of the sea which defies the cleverest painter or artist of any kind to get anything pictorial out of it. A dull smooth sea with nothing on it is the most monotonous, insipid, and characterless thing in nature. It is fortunate that this effect seldom exists for many days together, and the photgrapher who goes to the sea will find plenty to do, if he has the power of seeing what to do, and knows how to do it.

If my reader lives at the sea-side, there ought to be little that I can point out to him; but to the stranger who wants to do real work, I should say select an intelligent boatman, and engage him to carry your camera. Through him you will get to know other sailors. Listen to their yarns and be liberal with tobacco, and you will have a chance of getting pictures that could scarcely be got on any other terms. If you manage them properly, they will become greatly interested in your work, and be always anxious to help, and the assistance they can give is very real. Boats, ropes, lobster pots, and other "common objects of the shore," are heavy to move, and the boatmen are always willing helpers, always supposing you get the right side of them.

I have known half-a-dozen sailors work like slaves launching and beaching a great lugger for the benefit of a photographer; and I must confess, on the other hand, I have seen them very obstructive.

Charming pictures may be made of figures, boats, &c., taken on the beach, using a second negative for the sea and sky. All the precautions necessary for securing truth in a similar kind of picture on land must be more than ever observed in a shore view. The photographer would, of course, not be guilty of the mistake of using a sea and sky lighted from a different direction to that of the foreground, but there are other things that could scarcely happen inland that must be looked to here.

Suppose, for instance, the subject was a group of figures looking out on a raging sea, it would never do to take the group on a calm day; the figures would not be in accord with the sea, and it is very possible that there would be included in the foreground objects such a thing as a boat with its sails set to dry, which would of course be torn to ribbons in such a gale as was represented by the sea.

These observations are very commonplace and trite, but it is astonishing how easily obvious blunders will creep into photographs when they are anything but the ordinary thing done at one exposure. In the last exhibition I noticed several sea views into which the sky had been printed from a separate negative. In these the clouds were seen to go down to and behind the horizon. Now this is an effect that is never seen except in the clearest of latitudes; it occasionally nearly occurs in Cornwall, where the air is sometimes extremely clear, but I have never seen it further North during the observations of many years. There is always sufficient density of atmosphere to give a line of what may be called plain sky for some space above the horizon—that is, between the clouds and the sea.

Many fine pictures can be got of the waves breaking on the shore, from the dash of the giant waves, crashing and smashing themselves into foam on the shingle, to the beautiful effect of long, rolling waves creeping slowly over the wet reflecting sand. The chief qualification a photographer requires for taking this kind of picture is presence of mind combined with ready thought, so that he may be able to say at the instant, "This is good!" and pull the trigger; or, "This won't do!" and leave it alone.

The shore is very fertile in suggestions for subjects. The accessories are so picturesque that they call aloud to be photographed, and pictures containing figures can often be snatched with great ease. The photograph from which the illustration is taken was exposed without the little

girl knowing anything about it. The camera was focussed on the crab baskets, and the little girl came to play with them. The elder girl, who had been acting as model in several pictures, at a hint from the photographer, walked quickly to the baskets, stooped down to speak to the child, and, before she could look up, the picture was taken.

To the artist photographer a fishing village, picturequely situated between overhanging cliffs, presents dozens of available subjects. The space covered may be small, but the ever-varying life of the place presents continual change. On the beach the trawlers may be drawn up high and dry, keeled over on their sides, the fisher-folk mending their nets, or spreading out their tanned sails to dry on the shingle, while children swing and play on the ropes with which the boats are made fast. The odds and ends of the shore always present opportunities for groups and single figures of fishermen and girls following their occupation. The windlasses, piles of lobster pots, creels, bits of rope, anchors, barrels, and tar-covered buildings, all suggest picturesque incident, and dramatic situations. The return of the fishing fleet is full of lively incidents. Before the boats get to land, there are always groups of tarpaulined men, with their wattled creels, waiting to land the cargo. When the boat, after pausing a moment—a fine opportunity—on the top of the last wave, is driven straight ashore, she heels over, and the expecting groups rush to her leeward gunwale to receive the glistening and splashing fish—live soles, giant rays, pollock, whiting, red gurnard, and perhaps a conger or two. Here is a picture that could only come to him who knows how to wait, but which happens daily, and is certainly possible.

Then the sale of the fish on the beach by Dutch auction, the removal of the fish to market, or the packing them in boxes or barrels; all these give subjects. So also do the children on the sand; but this is so obvious, and has been so often done, that I will say no more about it.

ON COATING PAPER WITH GELATINO-BROMIDE OF SILVER.

BY L. DIXON.

Having tried all the ways that have been published for coating paper with emulsion, and others that have suggested themselves as a likely way to attain this object, I have met with but indifferent success with any of them compared to the samples that are offered in the market. The writer's object in recording his experience is to state how each method has failed, so that others may profit thereby who have been working in the same direction. First—we selected the method adopted for coating carbon tissue. By putting an endless band of paper of twelve feet lengths to revolve round a roller at the top of about seven inches diameter, the bottom was suspended by the weight of another roller inside, which kept it stretched into a trough containing the emulsion; turning the top roller caused the paper to revolve, letting the bottom skim over the surface of the liquid emulsion. This method I found would not give an even coating, running in streaks.

I next tried brushing on the emulsion when in a jellified state, and then running the same over a tin containing boiling water. This way dried the paper, instead of liquefying the brush marks and making it run even.

I then tried floating the paper on the emulsion. This gave bubbles and spots of various kinds.

By the next method I got the best results of any tried, getting a wood roller (say) of 1½ inch diameter, and rolling a band of paper as tightly on it as possible; the length of the paper must be the length of the room. Putting my emulsion in a half-round trough, having made a centre hole at each end of the roller, and made the pins to rest on each end of the trough, I take hold of the two corners, and draw the paper off the roller while the same is revolving in the emulsion, taking care to keep the paper flat on the floor. A minute or two by this method will coat a twenty-foot length, if the floor is long enough for this size. The short-coming of this plan is the expansion and cockling of the paper before the emulsion has set.

If this article is not too long I will give another way, which, for those who want enlargements for painting upon, offers on economical grounds an advantage, and very easy to do. Cut the sheets the size you require, dip them over head in water, then place them one over the other; roll all the water out you can; take a sheet off the top and place it on a levelled slab, perfectly flat; pour as much emulsion upon it as will, when spread, cover the head; carry it over with a broad flat brush. This must be done very quickly before it sets. The emulsion must be made rather thin, so that it will prevent setting so quickly.

When the image is thrown upon the paper, make sure the head is where the emulsion is floated. When exposed, hold a cardboard over the part sensitized, while you pencil the outlines of the body; the latter being painted solid, answers the purpose equally well with pencilling instead of having the whole sheet coated.

Correspondence.

READY-SENSITIZED PAPER.

Dear Sir,—As at the present time the question of ready-sensitized paper is being discussed, I should like to bear testimony to the efficiency of the plan mentioned in the last number but one of the News, viz., preserving the sensitized paper between leaves of bibulous paper previously soaked in a solution of bicarbonate of soda.

This plan I adopted soon after its suggestion in the News in 1871, and have continued its use to the present time, and would strongly advise those who have not tried it to do so, and if they use the precautions you mentioned the week before last, I do not think they will give it up, finding, as they assuredly will, the comfort of having a reliable method of preserving sensitized paper, giving the best results, and keeping a reasonable time.—I am, sir, yours very respectfully, W. S. Atwood.

THE PACKING OF PLATES.

Sir,—I was much interested in reading your article on "Packing of Plates," in your last number.

During my summer rambles with the camera, this has been one of my difficulties, and I had such a lesson last August, whilst in Switzerland, that I came home determined to find out some better method of packing than by placing strips of cardboard between the edges. As one has to work gelatine plates in such a subdued light, it is no easy matter to see that the strips keep their place, and if they happen to slip away, scratches and marks caused by the pressure may result.

For the future I intend to use those cheap cardboard boxes which Mr. Edwards sends out with his plates. I always use them for the purpose of storing away my plates, and when on a tour, they render changing a very easy matter; the only possible objection being their bulk. This, I think, might be sacrificed for comfort and perfect safety.—I am, yours truly, W. H. Plaister.

Proceedings of Societies.

The Photographic Society of Great Britain.

The ordinary monthly meeting of this Society was held at 5a, Pall Mall East, on Tuesday evening, the 12th inst., James Glaisher, Esq., F.R.S. (president), in the chair.

The minutes of the previous meeting having been read and confirmed,

Messrs. Norman May, J. S. Knight, J. T. England, and R. S. Kidd, were elected members of the Society.

The following is an abstract of the secretary's report:—The mental activity which has previously prevailed since the introduction of the gelatino-bromide process has now subsided, the dry-plate question having ceased to be a burning one. Although less papers have been read during the past year than in former years, valuable discussions have taken place on matters of general interest. The Council refer with satisfaction to the completion of the standard screws, which will be of great benefit, two sets having been prepared, one in hard metal, and one in soft; their use is now at the disposal of all who consider it desirable to make any change. The Society possesses two optical lanterns made by the late J. H. Dallmeyer—one a sciopticon oil lantern, the other an oxy-hydrogen lantern; these have already done great service in exhibiting slides at the last exhibition. The majority of the pictures shown at the 1883 exhibition were produced by the gelatine process, a very high standard of excellence being attained, many considering it the finest display the Society has yet exhibited. Doubtless the chief factor is due to the rapidity of exposures now permissible. In connection with the awards, photographers alone composed the jurors. The demand for wall space is getting every year larger, and some pictures last year were rejected; as the number of rejections increase, a higher standard of work will probably result. The Society now numbers 363 members, the largest number on the roll for some years past.

The Treasurer's report was then read, on which he (the Treasurer) remarked that the Society had made substantial progress in the right direction. If the Society were in a position to do it, he should suggest investing all subscriptions received from life members; but at present he thought it better to use the funds in such manner as the Council may deem best in conferring benefit on the general photographic community. No doubt in time these advantages would be recognised, with the result of largely increasing the ranks of the Society.

The reports having been read and adopted,

The Chairman proposed a cordial vote of thanks to Mr. Bird (the Treasurer) for his arduous duties, and hoped this year would enable him to devote as much time for the Society's welfare as he had done in the past, and that he would be able to give them as good a report; better he could not.

Mr. ADDENBROOKE, in seconding the motion, said the clear manner in which the accounts and vouchers were laid before him and his co-auditor Mr. C. Ray Woods, rendered their work of the most meagre character. The motion was carried by acclamation.

The CHAIRMAN noted, duriug the reading of the Treasurer's report, that the Society's Journal had cost some £14 less. Although the Editor has been out of health, he has been able to show a very good balance in favour of the Society. He was quite sure they were all very much obliged to Capt. Abney for the able manner iu which he conducted their Journal, and he asked for a warm vote of thanks, which was accorded.

The auditors, Messrs. Addenbrooke and C. Ray Woods, were accorded a vote of thanks.

The CHAIRMAN said, according to the rules laid down for their guidance, the silver progress medal is awarded for scientific research, not only through the past year, but through preceding years also. The medal has been awarded to Dr. Eder for his previous work. In asking the Treasurer to transmit the medal he would couple with it the Society's best wishes for his prosperity, health, and happiness.

The result of the election of officers for the current year to fill the places of those retiring was announced as follows :—

President—Mr. James Glaisher, F.R.S.
Vice-President—Col. Stuart Wortley.
Treasurer—Mr. W. S. Bird.
Secretary—Prof. Donkin.
Members of the Council—Capt. Abney, F.R.S., Mr. F. Bedford, Mr. T. Bolas, F.C.S., Mr. W. B. Bolton, Mr. W. England, Mr. Jabez Hughes.

The CHAIRMAN asked for a vote of thanks to Messrs. Burton, Cobb, Cowen, and Hollyer, for their arduous services as scrutineers, which was accorded.

COL. STUART WORTLEY: Mr. President, Ladies, and Gentlemen,—I am anxious to propose a vote of thanks to our most estimable and worthy President. Although the duty fell on him (Col. Stuart Wortley) last year, he could only say as last, that the success of the Society is due to the President. It would be impossible to find a man who could do the work like him; he was always present, and was referred to for his experience on all occasions; the energy he devoted to the Society was astonishing. His (Col. Wortley) own experience in council made him speak up for their president, and he could say from his heart he hoped their old friend may be spared many years to preside over them.

Mr. J. SPILLER was sure the remarks of the previous speaker were the sentiments entertained by all. Mr. Glaisher was always to be found in his place, and had been so for upwards of twenty years; he heartily seconded the motion.

CAPTAIN ABNEY: It is hardly necessary to put the vote in a formal manner.

Carried by acclamation.

In returning thanks, the PRESIDENT said he should always work to put the Society in the best possible position; but the Colonel must remember what a good council he had to assist him. With such a good council, Treasurer, and Editor, he ought to succeed; towards that end, all in his power he would do. Professor Donkin had been elected on the Council; he is now elected secretary. Mr. Maxwell Lyte has not been able to be with us, although he desired to be. I shall ask the members to pass a vote of thanks to our late secretary, Mr. Maxwell Lyte.

Carried unanimously.

The meeting then adjourned until March 11th.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE ordiuary monthly meeting of this Society was held in the House of the Society of Arts, John Street, Adelphi, on Thursday, the 7th inst., the President, the Rev. F. F. STATHAM, M.A., in the chair.

The minutes of the ordinary meeting held in December, and the lantern meeting held in January, having been read and confirmed,

The PRESIDENT announced that Mr. E. Dunmore was entitled to the Society's diplomas, he being the successful competitor, both in landscape and figure subjects, in the January competition; these would be presented later on in the evening. Unfortunately, there was not the interest taken in these competitions they had expected; in fact, one month they had no competitors at all. Some change had been suggested in committee, and he would ask Mr. Bridge to state what occurred, and the decision arrived at.

Mr. F. A. BRIDGE: The President asks me to state what has occurred in committee regarding these competitions. Briefly, I may say that the practice hitherto of passing round blanks each evening, to be filled with a title suggested by each individual member, has been the means of our getting a very large number of suitable subjects, from which only one figure, and one landscape subject, is selected; all the others, however good, being wasted. It has been thought that this manner of proceeding is a loss of force, and that it will be much better for the President to select the subjects this evening for the whole year, drawing them from two hats (one for landscapes, and the other for figures) consecutively, until the whole number of subjects drawn are approved by the majority of the members present. Members will thus have the greater part of the year before them to make their pictures, as opportunity presents itself. The competition pictures are to be delivered iu time for the December meeting.

The CHAIRMAN said it was desirable to make some change, for the present month they had no competition at all. Sending round papers was a trouble to the members; a subject is written, a member (generally a lady) is asked to draw one of the selections; if thirty subjects of each kind have been selected, only one of each are made use of, the others being wasted; so the committee considered it better for the chairman to draw ten of each kind—figure and landscape—from the subjects given, thereby saving trouble to the members, besides giving them the whole of the year to obtain their results. He hoped this arrangement would prove successful. It was really surprising how the competitions had fallen off, as everything has been decided by the votes of the members themselves, and the successful competitor has generally had a very large majority of votes.

The CHAIRMAN: In the absence of a paper this evening, our excellent friend Mr. Bridge has undertaken to make a few remarks on Willesden paper.

Mr. BRIDGE: As I could not get a paper from any of the members, one of whom said, "Try Willesden Paper," I ventured a letter to the manager, and received a very courteous reply. Visiting the Fisheries' Exhibition in common with everybody else, I noticed the roof was covered with Willesden Paper, so started off to Willesden, and was very politely shown over the premises by Mr. A. E. Healey, the manager, who has attended here to-night to answer any questions you may wish to ask him. "Willesden paper" is a paper treated with ammoniacal subchloride of copper. It is water-proof, rot-proof, and almost thief-proof. It is made in 1-ply, 2-ply, and 4-ply thicknesses; 1-ply is not absolutely waterproof, on account of the fine pin-holes not being perfectly closed; 2-ply consists of 2 papers welded together, forming a thicker substance; 4-ply consists of two 2-plys welded together, and so tightly do they stick, that it is possible to boil them for half-an-hour, and you cannot separate them. Here is some portion of a registered envelope with linen at the back, and here is some paper treated at Willesden. These will be boiled for half-an-hour, when the envelope will be nothing but a pasty mass. Here are some samples of Willesden paper which have been soaking in water since the 2nd ultimo, also pieces of ordinary paper which have been soaking the same length of time. The Willesden paper is quite clear, the other is little but pulp. Now what is it used for? We may want to cover a building away from the studio. Here is a dark-room they have taken the trouble to build up here for us, also a boat or trough of 4-ply material with two pails of water in it. Another thing suggested itself to him, and that was, a covering for printing-frames when a sharp shower comes on. It can be obtained a yard and a-half wide, so that the frames could be quickly sheltered. There was no fear of trouble with the Board of Works (which was a wonderful convenience, in his experience), because it is so light and portable. Another use would be a backing for picture-frames. It is also valuable for packing dry-plates. For dishes it is about the handiest stuff he had yet seen, it being only necessary to fold it up and stick the corners with elastic glue. The main question for photographers would be: How about the chemicals acting on the copper and ammonia? He developed a dry-plate that day in one of these extemporized dishes, and detected no difference. Some samples would be passed round coated with lac varnish; also collodion; hyposulphite of soda had been in one of them, but it was easily washed away. A sample of note-paper was also shown, but they had a difficulty in getting it light enough for some purposes. Mr. Bridge also stated that it would be exceedingly useful in making up slides for the lantern, as a substitute for mahogany. There would be a loss of an ounce and a-half in weight on each slide, which meant a good

deal when anyone was travelling with some hundreds of slides. The result of the boiling was then shown; the registered envelope was recognized only by the linen rag which covered it.

The Chairman said he was sure they were all very much obliged to their vivacious treasurer for bringing the subject before them. Even if there were some things not quite photographic, it permitted divers opinions being expressed on them, and valuable ideas followed. From what he had seen this evening, and previously at the Fisheries' Exhibition, he thought the material would be very valuable to photographers, and hoped there would be a good discussion. He remembered Mr. Leon Warnerke telling them that on a trip to Russia a lot of his apparatus was spoilt with water; if it had been covered with material of this kind, no doubt it would have been saved.

Mr. W. M. Ashman enquired whether, in welding the paper together to obtain thickness, it could not be formed into dishes for development at the same time.

Mr. Healey said they found a difficulty in getting a waterproof glue or mucilage with which to hold the surfaces together. The first principle was to volatilize the ammonia by heat; dipping the parts into a suitable solution, they could be stamped.

Mr. W. Brooks: Does an alkali or an acid affect the paper?

Mr. Healey: An acid bath would affect the copper, in which case it would not be water-proof.

Mr. King found the material useful for backgrounds; there is a texture in it which gives the soft effect obtained with woollen backgrounds.

Mr. E. Cocking desired to know if the width was limited to a yard and a half, because, the wider it could be made, the more useful would it become.

Mr. Healey said the outlay would be so considerable for machinery, that he did not anticipate the directors would incur the expense until they saw the absolute need of it.

Mr. A. Mackie: Could any paper pulp be made water-proof by treating it with copper?

Mr. Healey said Mr. Bridge mentioned that in building up the paper there is some of the mucilage between each sheet, which is found the best way of attaching the fibres.

Mr. Brooks thought the paper useful for collodion emulsion work, if a good surface could be obtained.

Mr. F. Howard said many amateurs had abandoned making their own gelatine plates, because of the difficulties of dark-room accommodation. A suitable dark-room built of this material was just what was wanted.

Mr. Healey mentioned that ferricyanide of potassium was the best test for "Willesden paper." This re-agent turns it a rich chocolate, an indelible fixed stain.

A vote of thanks was given to Mr. Bridge, which that gentleman preferred to pass on to Mr. Healey, the representative of the Willesden Paper Company.

The Chairman then handed Mr. E. Dunmore the diplomas for his pictures—"Out in the Cold," and "The Village Church."

The Treasurer passed round samples of albumenized paper, which had been forwarded to him by a gentleman. No particulars were given as to the mode of preparation.

The following from the question-box was next discussed:—"Are pictures upon ready-sensitized papers likely to be more or less permanent than those on paper freshly prepared?"

Mr. Brooks had noticed streaks of a lemon tint in several prints on ready-sensitized paper; these markings generally became apparent after the prints had been kept a few months.

Mr. Harrison's experience had not led him to think ready-sensitized paper to be any less permanent than freshly prepared; he had frequently noticed blue patches in some of the prints, as if unequal toning had taken place.

Mr. Bridge was able to corroborate Mr. Brook's experience, but he should rather call the streaks brown than yellow.

Mr. F. Howard: It has long been the opinion that it is not so much a question of ready-sensitized or freshly prepared paper which confers permanency, as the quality of the negatives. To illustrate his remarks, he now handed round a print with description appended which was printed more than twenty-five years ago; by the description it would be seen that the negative was well-exposed and of good density; toning being, of course, of equal value.

Mr. E. Foxlee could endorse the remarks of Mr. Howard. He (Mr. Foxlee) had several prints over twenty-five years old which were as good as fresh prints. After the lapse of a little time he could always trace prints from thin negatives or dense negatives.

Mr. W. M. Ayres passed round prints made by him twenty-two years ago, the particulars of which we reported last month.

The following subjects were chosen for competition during the year:—Figure 1, "The Shepherd"; 2, "Afflicted"; 3, "Happiness"; 4, Unearthing a Treasure"; 5, "Indecision"; 6, "Mother and Child"; 7, "Wrath"; 8, "Rustics"; 9, "Gone"; 10, "Age and Youth." Landscape:—1, "A Shady Nook"; 2, "Country View, including a Church with Ivy"; 3, "A Study of Leaves"; 4, "Clouds and Trees"; 5, "A River Scene"; 6, "Hay Making"; 7, "The Harvest Field"; 8, "A Roadside Inn"; 9, "Summer"; 10, "Village."

The Chairman suggested that the subject of old photographs be introduced for discussion at the next meeting, and Mr. E. Dunmore promised to open the discussion.

London and Provincial Photographic Association.

At the meeting of the above Society, held on Thursday, the 6th inst., Mr. A. L. Henderson occupied the chair.

Mr. F. W. Hart passed round some developing trays cast in celluloid. They were made in both opaque and transparent material, and had a well at one end to allow of the tray being held up for inspection of the plate.

In reply to a member, Mr Hart said they were moulded in steel moulds under hydraulic pressure, the cost of the mould for the size exhibited, quarter-plate, being £9.

The following question from the box was discussed:—"Are albumenized paper prints, made from citro-chloride of silver, more permanent than prints made on ordinary sensitized paper?"

Mr. Hart, some twenty years ago, had tried organic acids mixed with albumen, but discarded them, owing to the difficulty in toning.

The Chairman asked whether a print pressed with a very hot iron would not be likely to be more permaneut.

Mr. Debenham, as a matter of experience, did not think burnished prints had been found to be more permanent; in fact, it was rather the reverse. Silver became much redder in tone by the action of heat, and gold also probably underwent a similar change. He did not think the change of colour in an ironed print was due to the disappearance of gold.

The Chairman said he thought a Rev. Mr. Read some years ago took out a patent for a marking ink for which he claimed great permanency; in its composition tartaric acid played an important part. Perhaps paper sensitized as described in the question might give more permanent results if subjected to heat.

Mr. Debenham: Tartrate of silver decomposes by heat, and leaves metallic silver in the fibre of the material. Considerable heat is required to reduce it, and an excess of heat will not cause it to become brown in colour. He should not be prepared to accept as a fact, without good proof, that an ironed print on paper prepared on a citrate bath would be more permanent than ordinary prepared prints.

Mr. Haddon enquired if the change of colour took place in a print which was perfectly dry before being put in the burnisher.

The Chairman replied that it did.

Mr. Hart said that when gold was precipitated as fine gold and dried at a moderate heat—under boiling point—it was of a rich brown colour; but when the heat was increased to nearly redness, the metal became much lighter in colour, and that probably prints, when heated, underwent a molecular change, which caused a different reflection of the light.

Mr. Barker thought the image was a compound of silver and organic matter, and that the citrate of silver compound would be the more stable.

Mr. Briginshaw asked the best method of ascertaining the strength of an old carbon sensitizing bath.

Mr. Haddon suggested evaporating a measured quantity and weighing.

The following question was next discussed:—"Is there any method of coating paper with gelatine emulsion, so that after developing the film can be stripped off instead of waxing?"

The Chairman suggested the following as a likely method, viz., coat the paper with a varnish soluble in alcohol previous to coating with the emulsion; the developed negative might be placed in a bath of alcohol, and the film stripped off.

Mr. Barker thought that if a parchment-like paper, similar to that used by Messrs. Morgan, was French chalked, it might answer the purpose; he had been told by a friend that French chalk might be left on a plate very thickly without injury to the film, and he could himself verify the statement from experiments since made.

Mr. BURGESS had also left the chalk on the glass without injuring the film.

In reply to a question as to whether the advantages claimed for fumed paper applied equally to ready sensitized paper,

The CHAIRMAN said in his experience fuming was a great advantage. Ready sensitized paper could scarcely be over-fumed. The operation should, however, be performed judiciously. In his practice, two sheets of paper were put back to back about two inches from the top of a box, underneath them being a saucer containing the ammonia. The paper was laid on a piece of fishing-net stretched across, and the lid of the box was air-tight. No marks resulted from the use of the net, the same piece having been in use some time.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Board of Management held its usual monthly meeting at 181, Aldersgate Street, on the 6th inst.

The minutes of the previous meeting having been read and confirmed, Mr. L. W. Green and Mr. M. A. Wood were elected members of the Association.

Mr. ASHMAN submitted some proposed alterations in the rules which were discussed. It was decided that the meeting of the Board on March 5th should be special, in accordance with Rule 18.

The other business having been disposed of, the meeting terminated.

NORTH STAFFORDSHIRE PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Society was held on Wednesday, the 6th inst., at the Town Hall, Hanley, Mr. C. ALFIERI, Vice-president, occupying the chair.

The minutes of the previous meeting having been read and signed, Messrs. J. Beardmore, W. Woodall, M.P., Inshull, and Taylor were elected members of the Association.

The CHAIRMAN, addressing the meeting, apologised for his non-ability to demonstrate the progress of enlarging from negatives upon argentic paper, on account of an accident which had lately befallen his condensers, they having been cracked, and the new ones ordered not having come in time for the meeting. He would, however, give the members an invitation to his own laboratory next month, when he should have great pleasure in redeeming his promise. In the meantime, he called upon Mr. Allison—who, he was glad to see, had brought some fair-sized negatives—to give a demonstration in printing direct upon this paper.

Mr. W. B. ALLISON said that having heard a day or two previously of their Chairman's accident, in case it should not have been repaired in time for the meeting, he had brought a few negatives and some of Messrs. Goodall and Steven's enamel argentic paper, to prevent entire disappointment. The room having been darkened, printing-frames were filled as usual in ordinary silver printing, and, a gas burner being lighted, exposures varying from one to two minutes were given at about four feet from the frame. The resulting pictures were all developed successfully with ferrous oxalate developer, and were greatly admired both for their vigorous depth and the purity of the whites obtained with this paper, the pictures somewhat resembling platinum prints highly glazed.

This simple printing process was much admired, and a vote of thanks was passed to Mr. Allison.

The CHAIRMAN handed round a splendid set of about thirty lantern slides, made by contact printing upon bromide plates. The quality of the slides, with perfectly clear glass in the high-lights, showed that in careful and skilful hands alkaline pyrogallic development is equal to any other.

A vote of thanks having been passed to the Chairman, the meeting separated.

PHOTOGRAPHIC SOCIETY OF IRELAND.

THE usual monthly meeting of the above Society was held in the Royal College of Science, Stephen's Green, E., Mr. WOODWORTH in the chair.

The minutes of the previous meeting having been read and confirmed,

Mr. Samuel Boyd was elected a member, and Messrs. J. Robinson and R. Brown were proposed for membership, and will be balloted for at next meeting.

The CHAIRMAN then called on Dr. Scott for his communication, "On the Value of Diaphragms in Photographic Lenses" (see page 100).

There was a very well-sustained debate, some of the members having found the system of diaphragms as drawn up by the committee appointed by the Photographic Society of Great Britain of very great value.

By the courtesy of Dr. Scott, who had prepared a table showing the relative value of the stop, and the exposures necessary to obtain good pictures, Mr. Watson was enabled to compare this table with the actual exposures made during a tour in Wales last summer, and on only one occasion was there any difference between this note-book and table.

Mr. GREENWOOD PIM, as also Mr. E. P. JOHNSON, exhibited a collection of lantern transparencies produced on gelatino-albumen plates, the difference between these plates and the ordinary gelatine plates being very marked; the former being much the best for the purpose. Mr. Pim also exhibited some further results he had obtained on "Eosine" plates.

Mr. JOHNSON and Mr. WOODWARD also showed some specimens of enlarging made on gelatino-bromide paper, which were very good.

Mr. J. V. Robinson passed round a C.D.V. portrait which had been taken in an ordinary sitting-room at night, the subject having been lighted by two ordinary gas jets, the exposure being about fourteen seconds.

COVENTRY AND MIDLAND PHOTOGRAPHIC SOCIETY.

AT the ordinary monthly meeting, the chair was taken by the President, Mr. W. ANDREWS, who (after the business of the meeting) called upon Mr. A. E. ROLLASON (Hon. Sec.), to read a paper on "Exposures by the Oxy-Magnesium Light."

Mr. ROLLASON said that this phase of photography was quite new to him. It was suggested that if members would bring cameras to the meeting a few exposures might be made. He had made several trials of the light, and found it very actinic, but somewhat difficult to manage without proper apparatus. The light was too strong for direct illumination, and required the interposition of a medium to soften the light. In this case the light would be much improved if placed in a focus of a large reflector. Reflectors were also required to soften the shadows, which were found to be very dense. As several gentlemen who had brought cameras were now ready, and the President volunteering to sit for the first trial, preparations were at once made for exposure. Two twenty-ounce gas jars were filled at the pneumatic trough with oxygen gas (kindly given for the occasion by M. S. J. Lloyd). The magnesium wire was bent round a test-tube into a spiral form, and fastened to the stopper at the top of the jar. The jar was then placed about ten feet from the sitter, slightly to his left, on a camera-stand about four feet high, while the camera was to the right hand. All being ready, the wire was then removed from the jar, lighted, and re-immersed in the gas. The exposure was as near as possible about eight seconds; the lens, a single landscape of nine inches focus, No. 2 U.S. stop; the plate, W. T. Baynton's "Coventry Dry Plate." This, upon development, proved to be a failure, on account of the size of the stop and slowness of the lens, which the next exposure conclusively proved This was made under precisely the same conditions, same make of plate, exposure, &c., but with a portrait lens. No. 10 U.S. stop was a decided success, and resulted in a capital negative. The last was a group taken on a Wratten and Wainwright instantaneous, with the portrait lens, same stop, but with two lights burning, one at ten feet and the other at fourteen feet from the group. The exposure was thought to be about twenty seconds, and on development turned out fairly good. The plates were developed (at the meeting) exactly alike by Mr. J. M. Danks in a careful and efficient manner, considering the fact that neither the plate nor the correct exposure was known to him.

On the whole the experiment was fairly successful, and several members expressed a wish to further try the capabilities of the light on a future occasion.

After votes of thanks had been passed to Mr. Rollason and Mr. Danks, the meeting terminated about ten o'clock.

THE SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE regular monthly meeting of the above Society was held in the Masonic Hall on the 5th, Mr. Councillor S. FIRTH in the chair. There was such a numerous attendance of members, as to give rise to some talk of a larger room.

It being the first meeting after the Exhibition, many interesting matters were conversed upon concerning it. It was proposed that each member note down such ideas and suggestions on Exhibition arrangements as he may consider of use for next year, as it was unanimously decided to have one.

Mr. W. B. Hatfield then proposed that the Society vote their best thanks to the many gentlemen throughout the country who so kindly contributed to the Exhibition, which was unanimously acceded to.

It was agreed, on the motion of Mr. Taylor, that a special vote be sent to the Rev. H. J. Palmer and the members of the Liverpool Society for their large and interesting contributions.

The following gentlemen were then unanimously elected members:—Messrs. Johnson, Hibbert, Shields, Mottershaw, and Hayball.

Mr. J. H. Rawson then showed a negative with some map-like lines indented in the film, which caused much discussion as to the cause.

It was proposed that the members should commence a competition illustrating a subject to a given word suggested by the President, and the best pictures to be put in the Society's large album, with full particulars of the method of production; the first show of pictures to take place at the monthly meeting in April, and the word to be "Contentment."

After looking over and discussing a number of prints brought by Dr. Morton, J. H. Dickenson, Mr. Seaman, Mr. Pilley, and other members, a very pleasant meeting was brought to a close.

Dundee and East of Scotland Photographic Association.

The fifth regular meeting for the Session was held on Feb. 7th, in Lamb's Hotel, Dundee, when there were about thirty members present.

The minutes having been read and approved, it was arranged that the subject for the next monthly competition be "Portrait taken in Room."

Four new members were admitted, and one new application was handed in.

The routine business having thus been disposed of, the Chairman (Mr. W. D. Valentine) called on Dr. Tulloch to read his paper on "Shortcomings of Photography" (see p. 103).

A very animated discussion then took place, the Chairman leading off with the remark, that it was not fair to institute a comparison, as Dr. Tulloch had done, between an engraving and a photograph, unless the latter was printed on rough paper or in platinotype; and he also said that the widerspread use of highly albumenized paper for large pictures had done much towards preventing the artistic development of photography.

Mr. Valentine remarked, that the greater intensity of the shadows at the edges was in great measure due to the use of wide angle lenses.

Mr. G. D. Macdougald thought that the too great intensity of the shadows could be remedied by a full exposure. Dr. Tulloch stated that in a picture there should only be one point of pure black, whereas in a photograph there were dozens of such points.

The Chairman proposed a hearty vote of thanks to Dr. Tulloch.

Mr. Geddes, Arbroath, then made a few remarks regarding "Halation: its Cause and Cure." In his opinion halation was caused by the space between the back of the plate and the dark slide, and he found that the evil was completely remedied by laying a piece of blackened cardboard on the back of the plate.

The Chairman said he thought this would not be of use unless it was placed in optical contact with the glass.

Mr. Macdougald thought that the cause of halation was that the particles of silver bromide dispersed the light through the film; and he also said that compound lenses were much more apt to induce halation than single lenses.

Mr. Mathewson had got halation in a plate which had even been backed with burnt sienna.

A vote of thanks to Mr. Geddes was passed.

A question was found in the question-box:—"Is there any advantage in fuming ready sensitized paper?" It was the opinion of the meeting that there was a slight benefit to be derived from this, as it neutralized the acid in the paper, and caused it to tone more readily.

Talk in the Studio.

Colotypic Prints.—We have received some excellent prints from Mr. Riley, of Humberstone Road, Leicester, and he tells us that he has turned out finished prints within four hours from the receipt of the negative.

Artistic Photo-lithography.—We have received from Messrs. Eyre and Spottiswood an *Edition de Luxe* of the "Jackdaw of Rheims," reproduced by litho-photography from the artist's designs; the work having been executed under the direction of Mr. George Sims. Although there have been several printings, the register is perfect.

Society of Arts.—Mr. Bolas' third lecture was delivered on Monday last, and recent methods of producing photo-intaglio plates were described, and some experiments were made illustrating the application of photo-engraving to the decoration of pottery.

Bichromated Gelatine for Damp Walls.—*Walzl's Monthly* says:—"This bichromate of potassium is useful stuff for many purposes beside carbon work. A friend of ours occupied a house which boasted of an English basement, and, as is not uncommon with those domesticated cellars, the walls were damp. After having wasted the "substance of years" in trying to introduce the "dry process," he came to us for advice. We suggested bichromate of potassium. He applied this, mixed with size. He allowed a sufficient time for the light to act upon it and render it insoluble before going over it a second time. Paper now "hangs on those *inner* walls," and, as far as dryness goes, a bone is nowhere beside it."

Hawthorne and his Photograph.—Mr. Henry A. Bright, Hawthorne's most intimate English friend, gave the following account to Mr. Julian Hawthorne, in contradiction of a statement that his father was entrapped by Mr. Motley into having his photograph taken. "I went with him," he says, "to a photographer, as he had promised me a photograph of himself. He gave his name, and Mayall came up in a great state of excitement. Hawthorne got very shy, and grasped his umbrella as if it were the last friend left him. This, of course, was taken away from him by the photographer, and a table with a book upon it was put in its place. 'Now, sir, please to look intense!' He was afterwards told to look smiling (at the portrait of a lady!). I chose the 'intense' one, and afterwards had a copy of it taken for Hawthorne's friend, Mr. Fields." After Hawthorne's death, a copy was sent to Mr. Fields, others were sent to Mrs. Hawthorne and Longfellow. The original hangs in Mr. Bright's own room.—*Echo.*

New Paper Material.—Consul Gade, of Christiannia, has submitted to the United States Government a report relative to a new industry, or, rather, the use of a raw material for the manufacture of paper, which will soon be in use in Norway and Sweden. Among the raw materials already employed in the manufacture of paper are rags, esparto, straw, and wool; but all these are expensive, and this new and cheaper one, which consists of white moss, will now be added to the list. The moss is found in immense quantities in Norway and Sweden, but it is not the living plant as it grows in the fields which is used for making paper, but the remains of this kind of moss which have gradually accumulated in the woods. The mouldering which the moss has gradually undergone constitutes a preparation for the paper manufacture made by nature herself. A factory is now building for the manufacture in Sweden, and examination has shown that near this place many millions of pounds of the raw material are to be found; in fact, a quantity sufficient to support a large manufactory for many years. Paper of different thicknesses, and pasteboard made of the white moss, have already been shown, the latter even in sheets three-quarters of an inch thick. It is as hard as wood, and can easily be painted and polished. This manufacture is said to be very well suited for taking the place of wood for many purposes. It has all the good qualities, but none of the defects of wood, as it neither cracks nor warps. The pasteboard can consequently be used for door and window-frames, and for architectural ornaments of all kinds of furniture. —*Journal of the Society of Arts.*

Photographic Club.—At the next meeting, on February 20, the subject for discussion will be "On the best methods of obtaining black and white negatives on dry plates."

To Correspondents.

*** We cannot undertake to return rejected communications.

TYRO.—1. The objective to which you refer would probably suit your purpose better than any other in the market. 2. To the optical centre of the lens.

W. L. G.—We will do our best to serve you, but cannot be quite sure of being successful.

ROBERT SHAW.—If you wish to have the best work, you cannot do better than to go to the maker of the lens for what you require.

J. FOSTER.—We will make the experiment as you suggest, and write to you as to the result.

HEATH and BULLINGHAM.—We do not know the address of the firm, but imagine you might obtain the information by applying to the Autotype Company.

E. W.—1. You should demand the compensation you refer to, but the tardy registration may somewhat complicate the matter if the case comes on for trial in a court of law.

H. P. T.—Thanks for suggestion, which will undoubtedly assist us.

G. M.—1. Perhaps you had better try Spooner's, in the Strand. 2. The maker will doubtless give you all the information if you write to him.

WALTER POLLARD.—1. But little has been done, and that little is hardly satisfactory. Dr. Liesegang, however, publishes a small book on the subject, and if you write to him, he will doubtless send you particulars. 2. We think you have succeeded very well indeed in the case of the fern picture. For a subject requiring more vigour you should size one side of the paper by floating it upon a warm solution of gelatine—say one part in ten of water—and afterwards you should sensitize it by floating it with the gelatinized side downwards. Under no circumstances are you likely to obtain the vigour and full gradations of a silver print.

W. S. S.—The first article of the series appeared on page 482 of our volume for 1882, but as many of the numbers are out of print, it is impossible for our publishers to supply you with a complete set. You had better advertise for the volumes of 1882 and 1883.

G. MACKIE.—Dissolve ten ounces of gelatine in sixty ounces of water, and to one-half add three ounces of chloride of barium, while four ounces of sulphate of sodium are added to the other half. On mixing the solutions, a kind of emulsion is obtained, which is allowed to set, and is washed in the ordinary way. Melt, and add chrome alum solution until it begins to thicken, when enough glacial acetic acid is added to restore the fluidity.

H. E. (Rochester).—We have forwarded the letter as desired.

G. K.—1. Several use it. 2. Write to the Eastman Dry Plate Company, Rochester, New York, United States of America.

M. S. P.—We are not sure just at the moment, but will endeavour to ascertain the address of the advertiser to whom you refer. 2. If you address a letter for Mr. Crowe, to the care of the Hon. Sec. of the Liverpool Amateur Association (Rev. H. J. Palmer, Clare Mount, Wallasey), it will doubtless reach him. 3. We believe not, but a moderately skilled mechanic would have no difficulty in making one. 4. It should not cost more than £2 or £3, and could be had from any dealer in photographic apparatus.

E. A. MAXWELL.—It never came into general use in this country, and we believe the inventor has returned to St. Petersburgh.

S. W. S.—Your case seems pretty clear, and you had better now make a definite claim to cover the loss to which you have been subjected. Of course the other party may reasonably claim facilities for making an exactly comparable experiment, and in your letter making a claim, you should offer to assist him in this. You should claim for loss of business as well as for the value of the goods destroyed. Of course our advice is based upon the assumption that the mounts were supplied expressly for photographic use, and that they occasioned the damage. When goods are supplied for a definite purpose, and by a person who is in the habit of supplying them for this purpose, there is held to be an implied guarantee that they are fit for the purpose.

J. C. L.—You might perhaps do well to write to Marion and Co., of Soho Square.

S. C. RILEY.—Thank you for the collotypes, which are very good; you will find a few words about them in another place.

N. K.—As you are evidently a novice, we should advise you to begin with an apparatus for pictures 5 by 4 inches, and you will be able to obtain information as to prices, &c., from the dealers who advertise in our columns.

P. H. DAVIES.—The lantern you describe will answer the purpose very well indeed, and full information as to the method of working will be found in the YEAR-BOOK.

A. RICHARD.—All depends upon the construction of the lenses, and it is extremely probable that they might not work satisfactorily as a combination. You might try about six inches, as an experiment.

H. JARVIS.—Thank you for your letter, which we shall use shortly.

P.—1. We shall publish a short series of articles on the subject shortly. 2. No; it is generally convenient to leave about 2 feet as a skirting. 3. About 7 feet. 4. Not much less than 10.

LATERNA.—The reflector will not add very much to the illumination, but you had better let it be larger than the condensers.

ENQUIRER.—It looks to us as if the mounts were in fault; but you had better test the matter by cutting some prints in two, and mounting one half of each on the new cards, the second halves being mounted on cards which have proved satisfactory. If all the samples are kept in a slightly damp place and under similar conditions, you may soon obtain sufficient information to justify you in making a claim. See answer to S.W.S.

FRANK LASHAM.—1. If you have purchased the negatives, you must have a proper transfer of copyright for each. 2 Certainly not. 3. Such additions would not affect the copyright of the original, and even if no copyright exists with respect to the original, you can register a copyright as regards the altered pictures. 4. Yes.

DRY PLATE.—1. To harden the water, add a little sulphate of magnesium (Epsom salts)—from one to three grammes to each litre. 2. Simply because it takes a longer time to heat the large quantity, and it cools more slowly. 3. By using hard water, you obtain the emulsion in a more concentrated condition—that is to say, it absorbs less water during the process of washing. An emulsion can be more quickly washed in soft water, and it is easy to harden it by soaking for a few minutes in alcohol. As regards quality of the resulting emulsion, we do not think it makes any difference whether hard water or soft water is used, provided that no specially injurious material is present in either case. Write again if we have not made all clear to you.

W. DAVEY.—We will endeavour to ascertain. Have you Dr. Liesegang's little hand-book on the subject?

W. E. CRAIG.—1. It is sufficient if the precipitate subsides satisfactorily, and you pour off very carefully; otherwise it would be well to wash once or twice more. 2. We could mention several who coat on the bare glass, but some adopt the other method. 3. Add a solution of sulphide of potassium.

The Photographic News Registry.

Employment Wanted.

Retoucher & Assist. (Young Lady).—Miss J., 10, Edith-rd., Peckham, S.E.
Lady for Reception-Room.—E. D., 50, Crockherbtown, Cardiff, S. Wales.
Vignetter, good hand, first-class firm.—G. E. Lann, Market-st., Brighton.
Retoucher.—F. Piper, 56, Walford-rd., Stoke Newington, N.
Artist, for Monochrome and Water Colour.—Z. A., *Photo. News* Office.
Operator, clever at lighting, &c.—F.W., 1, Claylands-rd., Clapham-rd., S.W.
Reception Room, Young Lady ot exp.—M. A. G., *Photo. News* Office.
Reception Room, Shop, Books, &c.—W. C., 160, Arlington-rd., N.
Youth, as Assist Op. or Printer.—L. D., Cambridge-gardens, Notting Hill.
Assistant Operator and Printer.—E. D., 576, Sunderland-st., Pimlico.
Recep. Room, Mounter, &c.—M. W., 68, Parma-cres., Clapham Junction.
Printer or Gen. Assist. (young man).—Evans, 9, Church-st., Folkestone.
Reception Room, Mount, Spot, Books.—F. W., Chryssell-rd., Brixton-rd.
Printer and Toner.—Printer, 21, Crick-st., Burdett-rd., E.
Operator, Retoucher, Enlarger.—Alpha, 115, High-st., Camden-town.
Artist, well up.—P. Eckhart, 105, Hall-pl., Hall-pk., Paddington.
Retoucher and Colourist (lady).—J. J., *Photo. News* Office.
Artist, medallist.—Miss A. H., 88, Stoke Newington-rd. N.
Operator or Manager.—A. E. Walker, Eastwood, Notts.
Assist. Printer & Vignetter.—G. E. Cann, Market-st, Brighton.
Assistant Operator, or Manage Branch.—H. W., Finsbury-circus, E.C.
General Assist., good all round.—X. Y. Z., 49, Ledbury-rd., Bayswater.
Assist. Op., &c. (town only).—C. H. E., 50, London-st., Tottenham-ct.-rd.
Assist., can print, tone, paint enlarg.—Silver, 40, Gower-st., Birmingham.
Assist., enl. on Morgan's pap.—F. P., 16, Rochester-sq., Camden-rd., N.W.
Assist, retouch heads for publication.—Retoucher, *Photo. News* Office.
Reception Room, as Improver.—X. Y. Z., 5, Jesse-ter., Reading.
Assist. Operator, could manage.—F. B., 2, James-st., Illey-rd., Oxford.
Reception Room or Shop (Lady).—A.S., 77, City-rd., N.
Operator, wet or dry.—C. O., 25, Duke-st., Bloomsbury.
Retoucher, first-class.—Artist, 15, Hastings-st., King's Cross, N.W.
Artist in Oil and Water.—J. J. Gibson, 32, Pembroke-sq., Kensington, W.
Op. & Ret., wet or dry.—F. J. M., 6, Brockham-ter., Willsbridge, nr. Bristol.
Operator and Retoucher.—Alpha, 10, Hotspur-st., Kennington-rd., S.E.
Retoucher and Min. Artist.—Miss Lea, 443, Coldharbour-la., Brixton.
Silver Printer and Toner.—F. C. M., 35, Vincent-sq., Westminster.
Gen. Assist., all round.—G. L., 49, Ledbury-rd, Bayswater, W.
Op. & Retoucher, 50/- weekly.—H. H., 116, Cheetham-hill, Manchester.
Gilder, Joiner, Fitter-up.—A. J., 31, Charles-st., Southboro', Kent.

Employment Offered.

Young Woman, charge of Printing Room.—W. Winter, Midland-rd., Derby.
Printer and Toner, young, for City.—Viaduct, *Photo. News* Office.
Retoucher, first-class.—Negretti & Zambra, Photo. Dept., Crystal Palace.
Printer & Toner (female) to manage.—Holden & Co., 12, City-rd., Bristol.
Photo-lithog., perm. if comp.—X., c/o Smith & Co., Gresham House, E.C.
Traveller, to Sell Backgrounds.—Photo., 5a, York-ter., Clapham.
Printer, skilful Vignetter.—Morgan and Kidd, Helio House, Greenwich.
Silver Printer and Toner (good).—W. Wilson, 77, De Beauvoir-rd., N.
Photo-Lithographer & Photo-Etcher.—Meek & Co., 4, Cable-st., Liverpool.
All-round hand, wet & dry.—Tune & Co., Warrington House, Tottenham.
Retoucher of first-class ability.—H. W. Winter, Alexandra Rooms, Derby.
Printer, first-class, to Manage.—Byrne & Co., Richmond, Surrey.
Printer & Toner, dry-plate.—H. Friedmann, The Grove, Stratford, E.
Assist. Landscape Printer.—Carl Norman, Graphic Villa, Tunbridge Wells
Operator for Ireland.—D. W., c/o Marion and Co., Soho-sq.
Printer, young and clever.—J. S. Catford, Art Gallery, Ilfracombe.
Assistant Operator immediately.—P. G., c/o Marion & Co., Soho-sq.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

FADING OF PHOTOGRAPHS OWING TO HYPOSULPHITE IN THE MOUNTS.

FADING and fugitive as ordinary silver prints are admitted to be, the photographer who works carefully and takes such precautions as are generally recognized to be desirable, may reckon on a life of at least six or eight years for his pictures; provided, of course, that they are not exposed to especially injurious influences such as damp, when fading may set in at a much earlier stage.

A great, and by no means unrecognized evil, is the general use of sodium hyposulphite as an "antichlor," after the bleaching of the paper pulp; and it not unfrequently happens that a large quantity of the deleterious salt remains in the paper from which photographic mounts are made. It is scarcely necessary to say that a print, if attached to such a mount, is calculated to rapidly fade away.

There is no disguising the fact that at the present time a very large proportion of the mounts in the market contain so much sodium hyposulphite as to cause the rapid fading of any albumen print mounted thereon, and photographers are, perhaps, more interested in this matter than may at first sight appear. What, indeed, is calculated to so much damage the reputation of a photographer as for his pictures to fade in the course of a few weeks—or even days?

A ready means exists of testing for hyposulphite, and for testing, a card should be cut up and soaked for about half-an-hour in the smallest quantity of water, and after the water has been filtered off, it should be tested with iodide of starch solution, as directed on page 114 of our volume for 1883. We quote the directions for preparing the iodide of starch solution:—

"To prepare the iodide of starch solution, about twenty grains of starch are mixed with a few drops of cold water, after which a teacupful of boiling water is poured in, so as to break up the grains and form a very dilute starch paste; when this is quite cold, tincture of iodide is stirred in, not more than one drop being added at a time, until an intensely blue liquid is obtained. A little of this is next diluted, until the blue shade is *only just perceptible*, when a teaspoonful is placed in a white saucer; and if a solution containing as small a quantity as one-hundredth of a grain of hyposulphite is added to the liquid in the saucer, the blue colour will disappear."

If it is desired to make the testing very accurately, two white saucers should be used, and the same quantity of the blue iodide of starch solution poured in each. When the addition of the liquor in which the pieces of card have been soaking is made to the contents of one saucer, an equal quantity of water should be added to the contents of the second saucer. In this way the least diminution of blueness becomes visible; the contents of the second saucer serving as a standard of comparison.

If a mount taken from a batch shows any indication of hypo when tested as above, the cards should be rejected without hesitation.

There is no doubt as to the liability of a photographic stock dealer for all mischief which may happen as a consequence of faulty mounts which he may supply; not only substantive loss, but what is far more important—damage to reputation. One essence of an implied guarantee is the supplying of goods for a definite purpose, and when this is done, the vendor is responsible if they are not fit for the purpose. It is scarcely necessary to say that a photographer who buys his mounts from an ordinary stationer or printer has no guarantee, as in this case it cannot be supposed that the person supplying them has a sufficient knowledge of photography to understand what is needed. If, however, the printer is in the habit of supplying photographers with mounts, he would be held responsible for their quality in respect to photographic use.

Before making a claim for compensation, we would recommend that a print be divided into two equal parts, and one part be mounted on a card known to be reliable, while the other half is similarly mounted on the questionable cardboard. If both are now kept under precisely similar conditions as to moisture and temperature, the rapid fading of one may be taken as evidence of the faulty nature of the mount.

We may mention that we have numerous complaints of damage caused by mounts, often several in one week; and the photographic fraternity would be under considerable obligations to anyone who should make those who supply such mounts pay for their neglect.

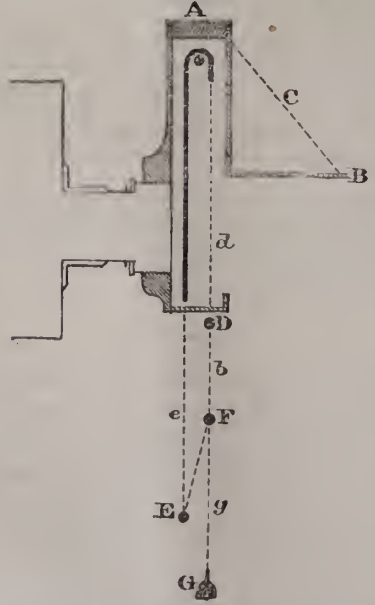
NOTES ON MR. HART'S LECTURETTE.

MR. HART'S lecturette, delivered to the members of the London and Provincial Photographic Association, was as instructive as it was interesting. It is some time since the subject of residues has been considered in a paper brought before the notice of any of the photographic societies, although it is one of those subjects which concerns the professional photographer to a considerable extent, and even now is very far from being exhausted. Judging from the discussion which followed, there is a very wide difference existing among the various practitioners in the percentage recoverable; Mr. Hart averring that in his own practice he is able to recover as much as eighty-five per cent. of the silver and gold employed. Some very practical suggestions were offered; among them we note Mr. Ayres' plan of pouring the liquefied metal into a vessel of water, thus obtaining a granulated form, at once familiar to most of us. In this state the metal may easily be cleansed from impurities should any exist.

Mr. York, who conducts his operations on a large scale, finds paraffine oil barrels of good service for holding the various liquids during precipitation, and he strongly recommended them for this purpose. We know several photographers who have pressed paraffine oil barrels into their service for a similar purpose, and from our intimate acquaintance with their usefulness, we can thoroughly endorse Mr. York's good opinion of them for the purpose named. One great thing in favour of their adoption is the comparative cheapness at which they can be obtained from any oilman's, viz., something like half-a-dozen shillings each; while for durability, they remain unsurpassed. So far as we are aware, no inconvenience has been experienced from the small amount of oil attached to and contained in the pores of the wood; should anyone feel fastidious on this score, the barrels are easily cleansed with a few pails of hot water containing some common potash, following this treatment by a prolonged soaking. An ordinary wood tap inserted about four inches from the bottom permits the supernatant liquid being drawn off without disturbing the precipitate. Probably the majority of photographers are more interested in the most efficient method of collecting the residues than the after operations of refining, which on any but the most limited scale can be so much better performed by professed refiners than by the photographer with limited means at his disposal; and here we may say that the use of common salt in the treatment of washing waters and other solutions containing free nitrate of silver is frequently, nay, nearly always, attended with loss. Hydrochloric acid is far more effectual, both in the matter of time for precipitation, and certainty of result.

A SHUTTER FOR THE STUDIO.

AN old form of shutter, made by Dallmeyer in 1861, has recently been brought again into notice as extremely well adapted for studio work. We take the sketch from the *Journal of the Photographic Society*, November 15, 1861.



A is a small box which fits on the hood of the lens, and the front or flap B is kept up by an elastic cord C; while in this position it serves as a shade for the lens. Inside the box, at the top, is a roller working on points at each end, and over this roller passes the shutter; this being made of a flexible material composed of strips of wood glued on thin leather. In the section the flexible shutter is shown by the thick line. A loop of string, *d e*, depends from the two ends of this curtain, and on the loop three rings, D, F, and E, are fastened, while to the ring F a tassel is attached by means of a string, *g*. By pulling down either the ring D or the ring E, the shutter becomes closed, and it may be opened for focussing or for a long exposure by pulling the tassel *g*, after which it is closed again by pulling either E or D. For a quick exposure, it is merely necessary, after closing the shutter, to pull D or E, whichever happens to be at the top. It will be noticed that the lower part of the lens is uncovered first and covered last, this being, in ordinary cases, no disadvantage. If, however, it is wished to make the shutter open from the centre, all that is required is to make the flexible shutter somewhat longer, and to cut two round holes in it.

By hanging a weight to the ring D or E, as the case may be, and adopting a pneumatic release, the shutter may be made automatic.

Although the above-described shutter is excellently well adapted for studio use, it is not likely to prove very convenient for landscape purposes.

TRIP TO SAHARA.

BY A COCKNEY.*

THE Customs' officer at Marseilles did not think much of me or my luggage. "Rien à déclarer?" he said, briefly, waving a bit of chalk. No, I said, there was nothing contraband about me; I only had a few dozen photographic plates. "Ah! ah! plaques photographiques—si, si!" and he smiled knowingly: "à collodion ou à la gelatine?" He asked the question much as a garçon at Véfour's demands whether you will take your artichokes *à l'huile* or *à la sauce?* Finding him so well grounded in matters photographic, I naturally rejoined that people did not travel with collodion now. "Ah, well, you havn't many, in any case," was his rather disdainful remark. I may add that he scorned to look at them.

Marseilles, with its broad, handsome streets, has several good studios; but the time between the arrival of train and starting of boat for Philippeville leaves you little leisure for anything beyond a stroll in the town and a breakfast in peace and quiet, very grateful after the rattle of an express train.

Algeria is usually visited by taking steamer across the Mediterranean to Algiers; but there is another not less direct route to the town of Philippeville, which is more east than Algiers. The latter route is on the highway to Constantine, the most romantic, as it is the most interesting, of Algerian towns; while a railway, moreover, helps one a hundred miles and more south, towards the Great Desert. The French Government, indeed, promises an extension of this railway right into the Desert—fifty miles over the sands—to Biskra, a large oasis, important on account of its large plantations of date palms, no less than from the fact that it is the junction of three caravan routes going south into the Soudan. Biskra is, in fact, my goal for the present, and at 5 p.m., on the day following my start from London, I am on one of the fine steamers of the *Compagnie Transatlantique*, bound for Philippeville. I think the distance is about 500 miles, but I am not quite certain; all I know is, that, after a most pleasant voyage of two nights and a day, I am landed on the African coast in the grey of a morning.

But I am getting on too fast. A word about the steamer. My London ticket is entitling me to privileges unprecedented, of which I must make some mention. Not only does it give me my meals free, but, from an important document hung up in the cabin, I am told what my strict rights are, so that the steward cannot take me at a disadvantage. Thus, the breakfast and dinner he must serve with napkins "damassées," while my service must be "porcelaine de choix," and my glass "cristal de choix." I am rather proud of this, as I strut the quarter-deck, for

* Continued from page 100.

I know that the second-class passengers (by this same announcement in the cabin) are only to eat off "porcelaine ordinaire," and drink out of "cristal ordinaire." Moreover, this same interesting pronunciamento specifies the hours of meals, and of how many *plats* they are to consist; how I am entitled to coffee and cognac; and, in case there are more than seven first-class passengers (and I am glad to say there are), I am to have the choice of four desserts instead of the three.

But there is a dark as well as a golden lining to my cloud of travel just now, to which I must allude. I mentioned in my first letter how carefully I had cut down every ounce of baggage, for you need not be an old traveller to know that your peace of mind depends upon the state of your baggage. Well, I am carrying into the desert an article which one of my companions designates the "nightmare." It is a dark-room reflector lantern of Marion's, and its history is this. A good friend, whose advice I sought on the subject of a trip to Algiers, said, "Go to Biskra, and I will give you a line to an old comrade I have there just now." The opportunity was too good to be lost, and I wrote to the Biskra gentleman; in my note I spoke of a speedy visit, and asked if I could be the bearer of any little object—photographic, microscopic, scientific, or what not. To him, also, the opportunity was too good to be lost, apparently, and the day before starting came a note, bidding me look on page 10 (I think it was) of the Year-Book, and bring him one of the lanterns there mentioned. I did not know the size of the lantern at that time; I do now. It is half the size of the Gladstone bag I carry, while on account of its fragile character—for glass and all, it is still in the same cardboard box forwarded from Marion's—the utmost care is necessary in handling it. No wonder, then, that I start up in my berth two or three times at night, and cry out about that lamp. "What on earth do you want?" says my companion underneath me in a querulous voice, as he raises himself and his warm clothes. "My lamp," is my reply; "I want my lamp." "Oh! bless your lamp; there it is where you put it, in a corner of your berth."

The captain and doctor breakfast and dine with us, and enjoy their meals so heartily that I cannot help thinking that they are never so well cared for as when passengers are with them to secure damassed napkins, choice porcelain, cut glass, and four desserts. The doctor discovered his wine corked on two occasions, and got it changed by the steward; but I noticed he did not find out the defect until he had drunk three-quarters of the bottle. I noticed, too, despite the magnificence of the catering, the gilding in the saloon, the marble panels, and shining mirrors, there was some sea sickness on board, which the all-pervading grandeur was powerless to avert.

A clear blue sky, and a sea still more blue, there were to gaze upon all day, but from early morn till late into the night not a single craft hove in sight. The whole live-long day passed away upon the silent sea without a speck on the horizon, for it seems that not until you get close to the African coast do you get into the track of vessels.

What will the first glance at Africa be like, and on what will you spend your first plate? is a question I ask myself. Murray in his Guide, I find, says that for every lion you kill you get £20, and I am thinking of recouping my expenses by encountering a monarch of the Atlas. As to photographing lions, I did ask one of my friends before I came away what sort of lens he thought best for the purpose, and he recommended one of long focus—the longer the better, he said. Now, as mine has not a very long focus, I think I shall let the lions be; I shall confine myself to going among the Arabs and taking some picturesque groups. And then it occurs to me that I read only last year of a European traveller in Africa who was stabbed to death by the natives while occupied in focussing with his head buried in the dark cloth. Really I don't half like the prospect before me, and begin to wish I was back again in the Tottenham Court Road.

I wonder, too, whether sand shoes will be any use in the desert—whether the yellow pair I wore on Margate sands last year would have been comfortable wear? Whether—but I had better be off to bed, and look after that dark-room lantern, for we land at daybreak.

Whirr—whirr—whirr goes the cable, and rattle, rattle, goes the donkey engine—we are there. I jump up: the sun has not yet risen, but it is light enough and clear enough. In ten minutes I am on deck to get a first peep of Afric's shore. Alas! no yellow sands washed by the azure sea, no tall palm trees rising straight towards the burning sun, no camels laden with spices of Araby to greet the eye, but instead, a green hill dotted with pleasant white houses, for all the world like Vevey on the Lake of Geneva, or not unlike the smiling Rothsay on the Clyde.

This is Philippeville. I land, my precious (!) dark lantern in hand, and my camera enveloped in an overcoat and encased in light waterproof, strapped over my shoulder. All is quiet on the quay, for it is very early, and not half-a-dozen people are stirring. Still, somebody has left four heaps of old blanketing on the granite parapet, while yet two other similar heaps are lying on the stone steps of the hotel as I enter. These heaps of blanket I find out afterwards are Arabs, to whom, it appears, the country belonged before the French relieved them of the responsibility.

But blankets turning into dusky Arabs is only the first surprise of many. To one who sees an Eastern country for the first time, the early impressions are wonderful. Here comes a whole procession of Ali Babas and their little donkeys, laden with wood; here is Mustapha, the tailor, seated cross-legged at his open shop-window; here is the Grand Vizier on horseback; here is poor little Moock with his big turbaned head and bandy legs; and here are baggy-trousered Ganems by the score.

Outside the town by a dusty road, and there, instead of a quickset hedge, is one of gigantic cacti. The cactus leaves measure fifteen inches long, and the hedge is a dozen feet high—as you look upon it, leaf growing out of leaf, a living example of the error of trying to be independent, and doing without stalk or stem, for the failure is so painfully ludicrous, it reminds you of nothing so much as the wonderful tropical plants they put in the transformation scene of a pantomime; the whole thing is to the Cockney eye so stupidly exaggerated.

I must wait for the night before I can fill my dark slides, so the cactus hedge must wait too. The damp sea-air is particularly injurious to gelatine plates, as everybody knows, so I have had my packages carefully enveloped in tin-foil, which previous experience has told me is one of the best means of assuring from damp. I might make use of the red lamp I carry, for filling my slides, but I prefer to follow Mr. Cowan's advice, and work in the dark. I open my slides and put them in proper order on the bed—it is a most safe changing table—and then having carefully placed all six plates, face downwards, in their places, I take a series of printed numbers, which I have for the purpose, ready gummed and perforated, and as I detach and moisten one after another, I stick them consecutively on the back of the plates, according to the numbers the slides bear. A little rehearsal in the dark is all that is necessary to proceed smoothly afterwards; and if you will only take time, and mind what you are about, you can work as surely as by candlelight.

PHOTOGRAPHIC RESIDUES, AND THE RECOVERY OF THE VALUABLE METAL THEREFROM.

BY F. W. HART, F.C.S.*

In selecting the subject for the lecture you did me the honour to request me to deliver before this Society this evening, I have chosen one to which I have given considerable attention for the

* Read before the London and Provincial Photographic Association.
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past thirty years, so, without further preface, I enter into practical working.

FURNACES AND APPLIANCES.

When possible, it is best to construct a fire-brick furnace. This is not a difficult matter. Dig a pit about 6 by 3, and 3 feet deep; lay a foundation of brick 3 by 2 at one end; on this form the ash-pit of the fire, 12 inches wide, 14 from back to front, and four bricks high laid on their sides; this, with the fire-clay luting or cement, makes it about 11 inches high—of course, open in the front. Over the front lay a plate of iron 5½ inches wide, 21 inches long, and ⅜ thick. Lay across the pit, at back, an inch bar ⅜ thick. You will now have an opening of 12 inches between the iron edges; on these the loose fire-bars are to rest. Now build up the furnace, 12 by 14 inches, to the level of the top of the pit, putting an iron bar (5 by ⅜) across the pit at the top of the furnace, and another 2 inches above the level of the fire-bars as stays to the front. For the chimney remove some earth behind the body of the furnace, 12 inches deep from top, 14 inches wide, and 18 inches long; in this excavation, form the throat of the chimney of fire-brick 4½ inch square, the top being 4½ inch below top surface of furnace; at the end raise a chimney 9 inches square inside for two or three feet, where insert a damper plate, then contract gradually to a height of 12 or 15 feet; the upper portion of 6 feet may be a stout 4-inch flue-pipe. Next fill in the sides and back with pieces of common brick and dry earth, and with an iron cover in two parts and a grating over the pit, your furnace is complete at a cost of about £3. Other furnaces are built on the floor-level, as my own, with hood for carrying off fumes from chemical operations; then there are portable furnaces of fire-brick cased in iron; and lastly, the extreme of portability is reached in the gas furnace. These latter are very convenient for trial reductions of small quantities, but when using a No. 6 clay crucible, which is a very moderate size for reductions, the pit furnace will be found the cheapest form of all; next to that the iron-cased fire-brick; such an one also forms an excellent appliance for keeping the work-room warm; their cost is from £4 to £6, to take a No. 6 pot. For fuel use gas coke—select the dense light-coloured or grey-looking, reject all the spongy black pieces and all dust; break the hard dense pieces into such sizes as will pass readily between the pot and sides of the furnace. To prepare the furnace for use, place in the centre of the bars a fire-clay stand or piece of fire-brick about 2½ inches thick; on this, for special precaution till experience in firing is gained, place a skittle pot stand easily fitting the bottom of the crucible; this will protect the bottom against currents of air through hollow places in the fire near the grate. Now place plenty of wood all round the stand, a light sprinkling of coals, and some of the softer coke, set light, and let it burn up gradually; the skittle pot stand, crucible and cover, the meantime being placed mouth downwards over the cover of the furnace a little apart, to allow the hot gasses to gradually dry and heat up the pot and stand. By this time the fire will need attention. Put a 3-inch layer of broken coke on that. Now put the skittle pot. stand, still mouth downwards, and the crucible on the top of that; cover up the furnace. They will now advance gradually to a low red heat. Then shift the crucible to one corner of the furnace, and the stand to opposite corner. The tongs must always be heated up before touching the crucible. Clear away the ignited fuel from over the solid stand, and place the open stand on it, and into it the crucible, now mouth upwards, and place the cover on. Now consolidate the fire with the poker and fill up all round with fresh coke, ramming with the poker as you proceed till it be level with top of crucible; partially close the damper so as to only keep the fire at a bright red heat. The crucible is now ready for its charge after glazing; to do this, throw in a few lumps of borax; when this has swollen up to a spongy mass, take the iron stirrer (never use the poker) kept solely for the crucible use, and rub it all over the inside of the red-hot crucible. We will now leave this and retrace our steps, and consider the collection and preparation of chloride of silver.

CHLORIDE OF SILVER.

The precipitation and collection at the present time is mainly from the print washing waters. These are best precipitated with commercial hydrochloric acid; this in a weak solution has no solvent power over the chloride of silver, neither does it add materially to gravity. Common salt, as usually employed, is objectionable on both grounds; the precipitate does not subside so readily when it is employed, and, being a cheap substance, unthinking operators usually add ten or twenty times more than needed for the purpose, and thus increase both evils. For the receptacles of the washing waters conical jars in stoneware, with the greater diameter at the bottom, are to be preferred to all others.

After each addition of washing water and acid it is vigorously stirred and left to subside, then, on clearing, a glass developing-cup or measure is dipped in to obtain a sample, a drop of hydrochloric acid added, and if there is no opalescence produced, the clear solution can be decanted by tipping the jar or syphoning off, or an upward filter syphon employed, such as I introduced about 1863, description of which will be found in journals of the time.

This goes on till a considerable deposit is collected at the bottom. The jar should now be filled up with clean water to take up any foreign salt or excess of acid, and when clear, pour or draw off as close as possible; pour the residue on to a shallow dish, and put into an oven or other warm place to dry off.

METHODS OF REDUCTION, WET AND DRY.

The wet is as follows:—Instead of pouring the thick residue from the jar into a shallow dish, let it be placed in an open-mouthed jar, into which place a small porous pot such as is used for voltaic batteries; or, in the absence of a porous pot, procure a bladder, fill it with weak acid solution, into which is inserted a plate of zinc with a copper wire attached; to the other end of the wire attach a plate of silver (an old spoon will do), and leave it undisturbed for twenty-four hours; by this time the chloride will have been reduced to the metallic state, the zinc remaining; porous septum and plate of silver is now removed, and adhering particles of silver washed off. The silver is now transferred to a larger vessel, and repeatedly washed till a sample of the clear solution gives no precipitate or cloudiness on the addition of a solution of carbonate of soda. The liquid can now be finally drained off, and the precipitate dried for sale or use; if for sale, it had better be put into a borax-glazed clay crucible with about five per cent. of a mixture of dry carbonate of soda and nitrate of potash, melted, and poured into the ingot mould.

THE DRY OR FURNACE OPERATION ON CHLORIDE OF SILVER.

Process A.—The thoroughly dried chloride of silver is mixed with powdered resin in the proportion of two parts of the chloride to one of resin, passed through the fine sieve two or three times, and then well packed in the crucible, and submitted to a low red heat. In the decomposition of the resin, its hydrogen in immediate contact with the chloride of silver reduces the latter to the metallic state, the hydric chloride passing off quietly, leaving the silver mixed with some carbon. The whole is then turned out on to an iron plate to cool, the crucible immediately returned to the furnace, and a mixture made of two parts dry carbonate of soda, one part nitrate of potash, one part dried borax. To these add sixteen parts of the silver and carbon mixture, and pass through the 36-hole sieve to thoroughly mix. The crucible should now be of a bright red heat; ladle in, and allow each ladleful to deflagrate and partially fuse, and so continue until the whole is added. Now see that the fire is well poked down, and the coke close in all round the crucible, and the furnace filled up to the level of the top of the crucible, put on the cover, and gradually increase the heat of the furnace to the yellow-white heat. After five to ten minutes of the strong heat, remove the cover, and stir up the contents of the crucible, and on withdrawing the stirrer, gather up on its end a portion of the flux floating on the surface, and examine it. If it is speckled with small beads of metal, give it a gentle stir round, and allow it to subside a few minutes longer; then gather up a fresh portion on the end of the stirrer; this time it will most likely be practically free from beads of the metal. Check the draught of the furnace. With the hot tongs grip the crucible on the opposite side to the lip, then steadily pour out the contents into the ingot mould, which must be perfectly dry and warm, and rubbed over with chalk. Have ready to hand a light wire hook to scrape out the crucible if necessary. The pot can now be put on one side, as it is not worth risking another reduction therein.

Process B.—The chloride must be quite dry, the crucible prepared as before directed. Take three parts dry carbonate of soda, four parts dry carbonate potash, three parts carbonate of calcium, and quarter of a part of fine white sand. All these must be very dry and intimately mixed by passing through the sieve two or three times. Take an equal weight of this mixed

flux and the chloride, pass them through the sieve for thorough mixing, and then place in a bowl by the side of the furnace. The crucible should now be of a bright cherry red heat. Introduce a small ladleful into the pot, and allow all effervescence to pass off before introducing a further quantity, and so on till the crucible is about two-thirds full of a semi-fused magma. Now cover the furnace, and allow the heat to rise to the yellow, occasionally looking in the furnace to see that the fire has no open channels through it, and that the contents of the crucible is in quiet fusion. On stirring the contents, it should feel very limpid, and on withdrawing the stirrer it should have a thin coating of flux, not showing the slightest bead of metal. The contents may now be poured out as in the A process.

(To be continued.)

THE INTENSIFICATION OF GELATINO-BROMIDE NEGATIVES.

BY DR. H. W. VOGEL.

The numerous difficulties incident to the intensification of gelatine negatives are sufficiently well recognized by all workers; while collodion negatives offer no special difficulties, and several methods are available, among which may be mentioned pyrogallic acid and silver, mercuric chloride, potassium permanganate, platinum chloride, and lead ferricyanide. All these methods of intensification—and, indeed, many others—have been tried for gelatine plates, but with but little practical result, except as regards the mercuric chloride process. Even this has had its opponents, who assert that negatives intensified with mercury are not permanent. Indeed, not a few photographers have found to their disgust that such negatives, which were stored up for future order, had become damaged even in so short a time as a year. These circumstances have created a distrust with respect to intensification, and manufacturers are continually asked to supply plates which will yield sufficiently vigorous negatives in the first instance. This is all very well in a good light and under favourable conditions; but in the bad light of winter it is not always practicable to obtain vigorous negatives directly, so a satisfactory method of intensification is essential in every-day practice.

Why, then, is it that many methods which are extremely satisfactory for intensifying collodion plates, are not adapted for gelatino-bromide work? It is only of late that the question has been satisfactorily answered; it is *because in the case of a gelatine plate, the intensifying materials not only act on the true image, but also on the gelatine film; while the collodion itself is absolutely inert towards the chemicals used.* In addition to the many materials employed in intensifying are extremely difficult to work out of the gelatine film, and if any portion is left behind, mischief may set in.

Let us take a few examples. During the last few weeks Dr. Eder has published some interesting observations, to the effect that uranium salts and ferricyanide of potassium exercise a coagulating affect on gelatine, and it is obvious that a mixture of these compounds, which has no action on the basis of a collodion picture, must considerably tan or harden a gelatino-bromide film, and therefore the intensifying action cannot be freely exerted upon the image itself.

The same kind of reasoning applies also to the ordinary lead intensifying process, in which the solution consists of a mixture of lead-nitrate and potassium ferricyanide, the gelatine being hardened as in the previous case. Potassium permanganate darkens not only the image, but also the whole of the film in the case of a gelatine negative, while in the case of iodine it is not possible to break off the intensification at the right moment, owing to the difficulty with which the reagent is washed out of the film.

Another circumstance which very considerably increases the difficulty of intensifying the gelatino-bromide image, is the circumstance that it exists wholly in the substance of the film, and not mainly on the surface, as is the case with a collodion picture. The image is far more accessible to the intensifying agencies in the latter case, and hence a pyro. or iron and silver intensifier will act satisfactorily, although so extremely slow in its action on a gelatine plate.

The best intensifier is, therefore, that which exercises no action whatever upon the gelatine film, and at the same time penetrates it with the greatest facility. We may safely say that as far as our present knowledge goes, the mercurial intensifiers fulfil these conditions most completely, and various methods of mercurial intensification have been carried into practice. We have in the first place, simple treatment with mercuric chloride followed by ammonia, and also the use of a mixture of mercuric chloride with potassium iodide and hyposulphite of soda (Edwards). Then again we have a similar mixture in which cyanide of potassium takes the place of the hypo (Eder); this latter working very satisfactorily, excepting so far as the cyanide becomes decomposed by exposure to air, the carbonate of potassium so formed tending to produce frilling. Negatives intensified by the method of Edwards certainly have a tendency to become yellow, and those simply treated with bichloride and subsequently with ammonia are less liable to change; but unless the hypo has been thoroughly removed by washing them later are liable to alteration. Not less important than the thorough removal of all traces of the fixing salt, is the effectual washing away of the whole of the excess of mercuric chloride before the plate is treated with ammonia. If both washings are thoroughly performed, the method of intensification in question (mercuric chloride followed by ammonia) is very satisfactory, and intensified negatives appear to be quite permanent. The slight change of tint which takes place on exposure to light is of no importance.

HENRI BECQUEREL AND PHOSPHOROGRAMS.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.*

I have thought that it might not be uninteresting to give a brief account of the manner in which M. Henri Becquerel has succeeded in viewing and measuring a part of the infra-red spectrum by means of phosphorescence. He notices, first of all, that if phosphorescent substances have a preliminary exposure given them, their luminosity is increased if they be subjected to heat, but lasts a shorter time. If an excited phosphorescent body be heated in the dark, the luminosity is seen first to become exalted, and then rapidly to die away. If a spectrum is projected on the surface of a phosphorescent tablet, the infra-red and red rays exert this same influence as does heat. Thus, if a phosphorescent plate be first exposed to light, the violet part renders it more luminous, whilst the green, red, and infra-red rays render it non-luminous. If the plate be again slightly warmed, the rays which have not been extinguished shine out with a greater intensity, and we have very dark lines in the solar spectrum standing brightly out on a black background. In this manner Edmond Becquerel, in 1866, showed some of the infra-red solar lines.

By stopping off the spectrum at an early part of the proceeding, the infra-red rays appear brighter than the rest, owing to the heating effect of the spectrum lying in that region; but this brightness rapidly dies away, and leaves blackness in its place. Thus, this part of the spectrum can be viewed in either of two ways, either showing dark lines on a luminous background, or luminous lines on a dark background. Another method, first used by Edmond Becquerel, was to excite the plate with white light whilst the spectrum was allowed to fall on it; but in this case it was necessary that the extinguishing rays should preponderate in intensity over the exciting rays.

Blende (hexagonal), reduced to fine powder, dusted over a gummed card, gives a green phosphorescent surface, which is rapidly extinguished. The experiments were conducted as follows:—Solar rays were reflected by the mirror of a heliostat, and passed through two parallel slits. The rays which passed

* *Photographic Journal.*

through the first fine slit fell on a prism of 60° of bisulphide of carbon, then on a lens which formed an image on the blende screen. Through the second slit, which was wide, rays of light fell on a flint glass prism, and then on the screen without passing through the lens. Thus, the infra-red of the first spectrum could be superposed over the violet of the second, which latter excited the phosphorescence, whilst the former extinguished it.

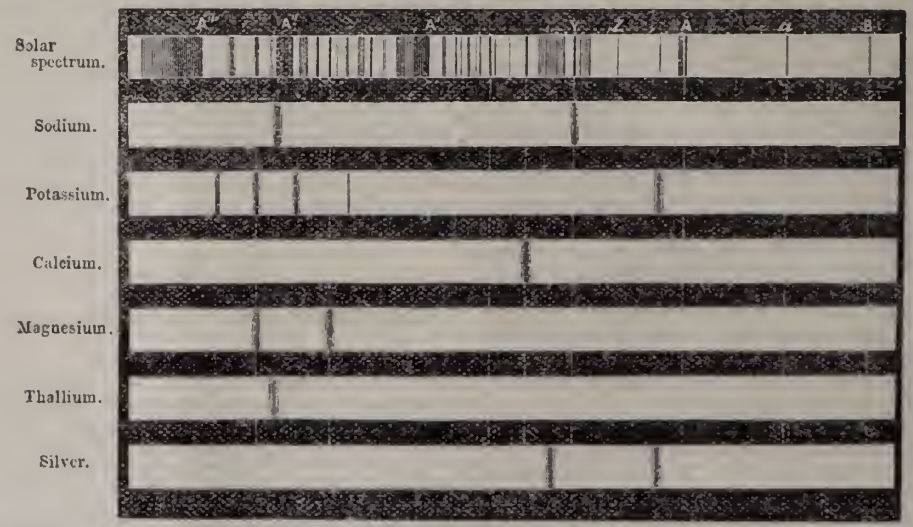
Henri Becquerel states that the blende allowed him to go further in the infra-red than other substances did, though he tried the following:—

Substance.	*Phosphorescence.*
Hexagonal blende	green.
Barium sulphide	yellow-orange.
„	green.
Strontium sulphide ...	yellow.
„	green.
Calcium sulphide	yellow.
„	green.
„	bluish-green.
„	greenish-blue } very luminous.
„	deep blue }

These bodies are all beautifully phosphorescent substances. From these experiments, he has mapped the solar spectrum, and determined some of the lines due to metal, some of which have been described before by myself. The annexed cut gives the drawing made by Becquerel. In another cut he has given the wave-lengths, which are as follows:—

The edge of A‴	12,200
Magnesium line between A‴ and A″ ...	11,310
Line to left of A″...	10,970
A″	10,820
Centre of A′	9,360
Another magnesium line	8,750
Y	8,190
Z	7,940
A	7,600

These lines are not quite in the position determined by the grating and photography, but are as near as can be expected from the method employed. The details given by photography are vastly superior to those given by phosphoreseence. Thus in the photographs, between A and Z a photograph will show 159 lines, whilst in the phosphorescent spectrum but 12 are shown. The greatest wave length shown is 14,800, a wave length which has nearly to be doubled before the limit of the solar spectrum is reached, as shown by Langley, Abney, and Colonel Festing. The lowest wave length reached by them was 28,000. With the grating 22,000 has been reached in the photographs. The region examined by Becquerel is that which it is easy to obtain by means of photography, and it seems as if below that point phos-



phorescence is incapable of giving any knowledge. The fact, however, that phosphorescence can give so much, is interesting; but great sharpness of detail can never be hoped for, since one particle of phosphorescent matter will excite a neighbouring one to a certain degree. The facts stated above as to the necessity of guarding the temperature at which the phosphorescent tablet is allowed to radiate has a practical bearing on the sensitometer now used, showing that the rate of emission may vary in summer and winter, if there be any great variation in the temperature. Mr. Warnerke has tested this matter, however, and it is probable that the interval he allows to elapse before exposing the plate to its action may have something to do with the negative results he obtained.

SHORTCOMINGS OF PHOTOGRAPHY.

BY DR. TULLOCH.*

With regard to light and shade, I consider they are not true to nature rendered by photography. Examine even the very best of photographs, and compare it with what you see in nature, and you must confess that the amount of black in it is far in excess of what you ever see in broad beautiful daylight. Cast your eye over a landscape and note that three-fourths of the whole is in half-tone, the other fourth divided between high light and deep shadow. Photograph the same landscape, and you will find a very different proportion. A tree-trunk or a large boulder innocent of black, so far as the eye could see, come out with shadows "Tarterian" in their depth. Let the light fall off so little that the eye can scarcely appreciate the shade at all, the sensitive plate will render it fourfold. The camera and the eye do not value light by the same standard at all: we judge by its luminosity, the camera by its actinic force—hence the confusion. Here we have a soft, delicate shadow, apparently only a little less intense than the high light; unfortunately, being reflected light, it has not actinic force in proportion to its apparent luminosity, and is rendered in the photograph as being many times blacker than it seems to the eye to be. But not only in individual parts does this hold good, for the whole general tone of the photograph is lowered from the very same cause. Those who practise landscape photography must have noticed how equally luminous the landscape and sky at times would appear to be. A photograph of the scene, however, represents the earth as many times blacker than the sky, and, whereas in nature the distant hills melted imperceptibly into the clouds, there was in the photograph a line of demarcation painfully plain.

To recapitulate, then, since we judge of light and shade by degrees of luminosity, and the sensitive plate by actinic value, and since shades are often luminous without being chemically active, I consider that light and shade as we see it is so far not correctly rendered in a photograph.

But photography has still another important shortcoming. I refer to the erroneous colour values which it gives us. I have already suggested, that as a mere matter of light and shade, the falling off of actinic force, even in feeble shadows, is out of all

* Continued from page 103.

proportion to the falling off of its apparent luminosity. I have now to go a step further, and remind you that in the matter of colour, of two tints, the brighter to the eye may be rendered the darker, and the darker to the eye come out the brighter. This is an entire reversal of our sensations, aud I need scarcely point out how scrious a fault this is. To be utterly false to uature is bad enough, but were we left the same range of contrasts, even if they were erroneous, our pictures might still be beautiful, as witness many charming effects in portraiture, where, although the various tints of the subject are erroneously giveu, the error is as often on the side of heightening contrast as reduciug it. In landscape work we are less fortuuate, for the prevailing colours in a landscape being various tints of yellow, brown, or green, all of about the same actinic value, we entirely lose the beautiful contrast which we see with our eyes.

Not only does the picture suffer in artistic effect from this, but should it happen that two objects of about the same actinic value lie side by side, no matter that one is orange and the other a dark olive green, they will be run together, and probably in many parts indistinguishable from each other, thus introduciug an element of great confusion. I was very much struck by this some time ago, photographing at the Gaunseley, near Breechin. To look up the water from the bridge the scene was beautiful. A few large boulders at the edge of the stream were the darkest objects, then the wet banks only a little lighter, then the dry earth above in still lighter tints of red and brown, above that, dry grass strewn with withered leaves, and last, the trees—everything from light yellow to deep sombre olive green. I was considerably disappointed, on printing from this negative, to find that to distinguish this tree from that, or to discover where rocks terminated and banks began, I had to hold the print within four inches of the eye. There were no beautiful contrasts—indeed, a few feet away it was difficult to make out even the nature of the subject; beyond that there was a sky, and something white (water perhaps), running down the centre of the picture.

Having gone over what appear to me to be some of the principal shortcomings of photography, I may, perhaps, be allowed a few words as to how these faults are to be expurgated.

In the first place, I am convinced myself that "gelatino-bromide" has done nothing for us artistically; on the contrary, I am quite sure that the various shade and colour values were more correctly given by collodion. I would not for this reason resort to collodion, but would rather hope that very soon we may be able to prepare plates exceeding gelatine in rapidity, and collodion in quality.

Certainly *the* improvement which we stand most in need of, as far as the chemical department is concerned, is the introduction of a plate giving us colours rendered correctly in black-and-white according to their visual values.

With regard to the excessive amount of detail, I would obliterate much or little of it according to circumstances, by printing upon paper with a proportionately rough surface. Small pictures to be viewed in the hand, since breadth is not of so much importance, could be printed upon a moderately smooth surface, while large photographs, intended for the decoration of walls, requiring breadth and force, and where detail to an excessive amount would be out of place, would be better printed upon rougher surfaces.

With regard to the intensely black shadows, I would obviate that by using a printing process capable of printing only to a certain depth.

I need scarcely say that this would exclude albumenized paper. A determined effort should be made to throw off the trammels of the vitiated taste brought about by albumenized paper pictures. We have been so long used to the pure high lights and deep black shadows, that a picture with less spice in it (so to speak) is apt to strike one as wanting in contrast, or to have a washed out appearance. This impression should very soon wear off, and I have no doubt but that then we would recoguize how violent an effect is produced by printing upon such a surface. With regard to the fiue contrasts which we lose from non-actinic colours in nature, I see no other way than to add them by hand.

I saw it mentioned in the photographic journals not long ago, that on the Continent, in copying works of art, correct colour values were added by skilled artists. Of course, if it is necessary to do so in copying paintings, it is just as necessary in photographing from nature. I have tried the plan of covering the back of the negative with tracing-paper, and working upon that with the pencil and stump. So far I have not been successful, the parts added being distinguishable in the print. More recently I have produced enlarged negatives from small transparencies, using "gelatino-bromide" paper. There are more successful and most effective alterations can be made either with colour or pencil. The negative, even after it is waxed, is not nearly so transpararent as glass, and the shadows do not print to such a pitchy black, giving thereby a truer effect. The very slight grain of the paper is rather an improvement than otherwise, especially in large pictures.

A FEW NOTES ON CANARY MEDIUM.

BY THOS. H. W. KNOLLES.*

Some time ago your Secretary gave me some of the canary medium, and asked me if I would try it and give him the results I arrived at.

The sketch I show you will explain the kind of room and light I have to work with. It is a small room, twelve feet by nine feet, lighted from the ceiling, which at one side slopes from near the floor. The window is two feet six inches by one foot six iuches, aud I fitted a box below it open on the top, and faced with the canary medium to give me a light directly in front when developing. This box has a shutter of brown paper stretched ou a frame to cut off as much light as is wished. The window has also a frame fitted to it, which is put up with four buttons, and it also has a brown paper shutter to regulate the light.

As my window faces east, these shutters are necessary when the sun is bright. I put on the frame three thicknesses of the canary medium; these I oiled in the same way as was usual with the ruby paper. The flood of light was very great, so much so that your Secretary, when he came iuto the room, made the remark, "What white light!"

By drawing the cord to the shutter I can make the room as dark as I please. After closing this shutter I selected two plates, one a Fry, the other a Bennett, and proceeded to make trausparencies from two negatives selected.

I then let the shutter drop right down, so that the full flood of light came upon the plate. The light at this time was so strong I could see a pin on the floor nine feet from the window. These two plates I now show you. They are *quite free from fog*. The developing dish was on the table two feet six inches below the window, and the plates were frequently lifted for examination. I then proceeded to make another transpareucy from a rather thin negative, and placed it at a distance of ten inches from the frame with the same light as before, and exposed it for five minutes, the result being a pretty fair picture. From this it was clear that, however well a plate might be developed at a distance of two feet six inches from the window, the light was far from being a safe one to trust too much to. I then removed the oiled paper and substituted two sheets of the paper unoiled, and exposed another plate for five minutes, the result being a *very faint* outline of the portrait. I then oiled one of these sheets of paper, and exposed another plate for five minutes in the same way as before, and in this case got much more detail. From this it would appear that two sheets of paper is the quantity required for a light directly in front, while one sheet oiled and one unoiled if the direct light is cut off by the shutters, as I use them, give a very pleasant and safe light to work by. I found even the two thicknesses of the canary medium gave a much more comfortable light to work by than the old ruby, which was so very trying to the eyes. I intended going over these again, giving an exposure of three minutes, but the weather being dull I had to give it up, but hope to have another opportunity before long.

* Read before the Edinburgh Photographic Society.

Notes.

Captain W. de W. Abney, R.E., F.R.S., will give the first of a course of six lectures on "Photographic Action Considered as the Work of Radiation," at the Royal Institution, on Saturday next (March 1).

A strange thing we noticed the other day when buying

some photographs of Algerian life. Some bore the name of a photographer at Algiers, and some of them emanated from Oran. But the best cartes and cabinets were mounted on plain card. Why was this? Were the negatives taken and printed by an amateur who did not desire his name to go with them, or were the pictures purchased unmounted by the shopkeeper and finished by him? We rather think the first must be the true explanation, for a shopkeeper would never let such an opportunity pass to advertise himself.

Several German photographers have distinguished themselves in African travel. It is but a little while ago that we recorded the death of Herr Remélé, who travelled with Gerhardt Rohlfs through the Libyan Desert; and it is hardly a twelvemonth since another member of the Fatherland was stabbed by Arabs while with a camera in the desert. The two photographers who are missing from Baker's force, and of whose death there can now be little doubt, were also of German nationality.

It is pleasant to find that the courtesy which has existed in many quarters among professional photographers, in permitting a visitor the use of their dark rooms for changing plates, is not fading away. A correspondent, a gentleman whose name is familiar at the Pall Mall Exhibitions, writes us that he has recently made tours in Ireland and also in Italy, and he always found that a few words of introduction on his part sufficed to secure him the hospitality he desired. In Italy, he was particularly pleased with the desire to serve him by several brethren of the craft—a disposition, he says, all the more praiseworthy, since our friend was taking photographs similar to those his hosts had on sale. In this way the *mauvais quart d'heure* of changing plates at night in an hotel bedroom was converted into half an hour's pleasant chat.

A sign of the times is very evident in one of the chief illustrated papers of Paris, *le Monde illustré*. In a recent number of the paper we counted thirteen illustrations, and of these no less than eleven were taken from photographs. But this is not the chief point; underneath each picture was its title, and in the form of a sub-heading were the words "Dessin de ——; Photographie de ——," the photographer thus receiving full honours with the draughtsman. In the edition we saw, were the names of several well-known Paris photographers, to wit: Rentlinger, Numa Blanc, Mulnier, Ladrey, &c.

We also note that the *Illustrated London News* is beginning to give due credit to those photographers to whom it is indebted, as one of Mr. Faulkner's charming studies, given as a supplement this week, bears his name in the place of honour. It is a charming study portrait of the Princess Louise, and it is printed in the red chalk colour to which Mr. Faulkner is so partial.

Some studios put up their notices about payment in advance in the reception-room; others place it upon their cards of terms; while others again either convey the announcement verbally, or hang it up in the studio. Of all these plans, we think the most effective is that of putting it up in the studio. There is always a class who object to pay in advance, and the scruples of these are often overcome when they see something has been done on the part of the photographer; while the latter, on his part, may work more conscientiously and with more spirit, if what he does in the studio will influence the payment of fees.

Moreover, the plan of notifying payment by a notice in the studio has the advantage of plainly putting the matter before your patron. There is always plenty of time for the visitor to look about him between the taking of this pose and that, and he, seeing the pains you are at to please him, must be very hard indeed to move, if he is not willing at the end of the sitting to pay your fee. Many photographers request simply a deposit—sufficient to cover the cost of the negative—and leave the rest of the payment till the prints are supplied. In Berlin, some make it a custom to require half the fee to be paid on the first visit; but, as we say, there are many things to recommend the putting up a notice in the studio itself, and taking the money after posing.

Another examination for diplomas will be instituted this spring by the French Syndicate. Last year, it may be remembered, about a dozen assistants presented themselves as candidates, and nearly all of these obtained certificates of various grades. This time there is likely to be an augmentation in the number, for some of the principal European firms have shown themselves disposed to employ these certificated assistants.

In Paris several of them have found lucrative employment; while in Madrid, the management of the first photographic atelier is under the superintendence of a Paris diplomé. We hear that St. Petersburgh and Vienna are also enquiring for these certificated assistants, and we have not the least doubt that some of our London establishments would be open to them.

Many photographers, in travelling, pack their films between sheets of paper, and if the packages are small there is not much to fear from such an arrangement. But it behoves one to be very careful as to the nature of the paper to be employed for interleaving the plates. No one is likely to employ ordinary printed paper, which almost inevitably leaves impressions behind on the sensitive film, so we need not say a word on that score. Almost as bad are harsh-fibred papers, in which the woody fibre—there is wood in nearly every paper manufactured now-a-days—is incompletely pulped, and liable, therefore, to abrade the film. Some papers there are again, which are very acid, and although the photographer is not likely to employ any other but very dry sheets, still this is a feature to be

borne in mind. A good bibulous paper is suitable, though best of all is Swedish filtering, which is the purest paper in the market.

When the German Photographic Society hold their annual meeting in Berlin this summer, a gold medal will be given for the best portrait, irrespective of the candidate's nationality. Conditions are briefly: The portrait must be taken in 1884 upon a gelatine plate, and be printed upon a whole sheet of albumenized paper; it must not be vignetted, and every candidate must send four framed portraits. Artistic retouching is desired, but rough prints must also be sent for the satisfaction of the judges, and details as to exposure and lens are to be appended. The pictures must not be forwarded anonymously, but with a motto attached, on or before the 10th of August, to Herr Karl Schwier, at Weimar.

There appears to be no other way of steadily producing gelatino-bromide plates throughout the summer than by working by night instead of by day. During the past season, several establishments commenced work at 9 p.m. instead of early morning, and these were enabled to continue their labours without a break.

Fine art on advertising hoardings was talked about a good deal when Cassell's brought out their Magazine of Art a few years ago. It will be remembered that Herkomer produced for this firm an immense art placard, which, after all, with its group of classic figures, was rather bald and uninteresting. Perhaps it was for this reason that no one followed the example of Messrs. Cassell, and engaged other members of the Royal Academy, at princely fees, to do likewise. Yet, there is no reason why we should not have plenty of art productions on our hoardings, if photography were called in to aid in the matter, and this, too, for a comparatively small outlay.

All that is necessary is to choose a little picture suitable for enlargement as a placard. Such artists as Du Maurier, Fred. Barnard, and John Proctor, whose pictures in black and white have been the admiration of the public for years past, do not demand more than fifteen or twenty guineas for the most charming productions, and there is no reason why their pictures should not be enlarged by photography to gigantic proportions. The enlarged photograph, being an absolute *fac simile*, could be inexpensively converted into a huge printing block, by a subordinate hand, and the result would be an effective poster, having, at a distance, all the charm of the original. The reason why our present wall pictures are coarse and inartistic, is simply because the hand that does them is either unskilled or unused to such big work. By having recourse to the enlarging camera, the best artists in black and white might be pressed into the service, and effective and tasteful placards would be forthcoming at small cost.

The long-talked-of Photographic Museum at South Kensington is gradually assuming an existence. Several objects of historical interest connected with the invention have already been collected, and Captain Abney, who has taken the matter under his wing, is sanguine of making the collection a very complete one.

Unfortunately, it will be difficult to make the Museum altogether complete, unless it is international, for France and America, let alone other countries, will not readily part with any relics connected with early photography they may possess. Fortunately, Nicephore Niepce, when he visited England in 1827, left behind many interesting examples of what he then termed heliographie, and some of these are now in safe keeping in this country.

In presentiug the medal of the Royal Astronomical Society to Mr. A. A. Common, for his photographs of celestial bodies, the president gave a very interesting resumé of Mr. Common's work. Mr. Common was first engaged in celestial photography in 1874, and was then working with a 5½-inch reflector. Apparatus of increased power, and designs to meet special requirements, were substituted from time to time, until a gigantic disc of three feet diameter was finally employed. The first attempt to photograph the nebula in Orion in January, 1880, was a failure, but Mr. Common, instead of abandoning the idea, made such improvements in the clock-work arrangement as enabled him afterwards, in March, 1882, to obtain the photograph which has excited so much admiration. The president laid great stress upon one fact which Mr. Common's experiments seem to have established—the necessity for long exposures in celestial photography. It appears that the longer the exposure, the better the detail; and even with an exposure of an hour and a-half, the limit of usefulness was not reached. "The success of these long exposures," remarked the president, "with this powerful instrument, has opened out a new field of research, by which the accumulating effect of the light of faint stars, too faint even for observation by the eye, have been registered upon the photographic plate." It should not, however, be forgotten that without the gelatine process Mr. Common's photographs would have been impossible.

Patent Intelligence.

Applications for Letters Patent.

3211. John Henry Johnson, of 47, Lincoln's Inn Fields, in the county of Middlesex, Gentleman, for an invention for "Improvements in the production of surfaces for printing."—A communiation to him from abroad by Auguste Tournoux, of Paris, in the republic of France.—Dated 13th February, 1884.

3510. Henry Bratt Sharp, of 5, South John Street, Liverpool, in the county of Lancaster, Optician, for an invention for "Improvements in portable legs, supports, or standards for the stands for cameras, stereoscopes, telescopes, theodolites, music, easels, surveyors' staffs, and other purposes."—Dated 18th February, 1884.

Specifications Published during the Week.

3258. Joseph Julius Sachs, of Union Court, Old Broad Street, in the City of London, for "Improvements in the production of designs upon rollers or surfaces for printing, stamping, or embossing."

The claiming clauses are: First. Producing designs upon rollers or surfaces for printing, stamping, or embossing, by first submitting the said rollers or surfaces to the action of a sand-blast, or the impact of hard particles to produce a grained ground thereon, then applying a sensitive solution to the said grained ground, or transferring or producing thereon a design in greasy ink or other resist, and subsequently treating the said rollers or surfaces so prepared substantially as and for the purpose hereinbefore described.

Second. Producing designs upon rollers or surfaces for printing, stamping, or embossing, by first submitting the said rollers or surfaces to the action of a sandblast or the impact of hard particles, so as to produce a grained ground thereon, then covering or protecting a portion or portions thereof with a stencil or resisting medium, and again treating with sand or hard particles in such a manner as to produce a ground with different grains, then applying a sensitive solution to the compound ground thus produced, or transferring or producing thereon a design in a greasy ink or other resist, and subsequently treating the said rollers or surfaces so prepared substantially as and for the purposes hereinbefore described.

Third. In the production of designs upon rollers or surfaces for printing, stamping, or embossing, effecting the etching, engraving, or biting-in of the design under a vacuum or partial vacuum or during the withdrawal of the air and gases substantially as and for the purpose hereinbefore described.

Patents Granted in America.

292,884. LEOPOLD WOLF, New York, N.Y., "Combined toilet-mirror and photographic album." Filed May 31, 1883. (No model).

Claim.—1. The combination, with an upright supporting-frame, of a centrally-pivoted and reversible panel having a mirror at one side and a photograph-album attached at the other side, the album being centrally pivoted to the back of the mirror-panel, substantially as and for the purpose set forth.

2. The combination, with an upright supporting-frame, of a centrally-pivoted and reversible panel, having a mirror at one side, and a photograph-album at the other side.

3. The combination of the upright supporting-frame, and a centrally-pivoted and reversible mirror-panel, with a locking device applied to one of the pivots, substantially as described.

4. The combination, with an upright supporting-frame, of a reversible mirror-panel, turning on centre pivots, and the upper pivot being provided with a spring-pressed locking device, while the lower pivot is provided with a torsion-spring, by which the turning of the mirror in the supporting-frame is facilitated when the locking device of the upper pivot is released, substantially as and for the purpose set forth.

Re-issue.

10,448. GEO. S. NORTH, South Norwalk, Conn., "Photographic camera." Filed Oct. 30, 1883. Original No., 276,455, dated April 24, 1883.

CHAPTERS ON LANDSCAPE AND OUT-DOOR PHOTOGRAPHY.

BY H. P. ROBINSON.

No. 7.—THE SKY.

I SHOULD like to begin this chapter with a bold proposition with which some photographers may not entirely agree. It is this: *The beauty of recent photographic landscapes depends in a very great degree on the introduction of skies from separate negatives.*

In the first edition of "Pictorial Effect," I found it necessary to enter into a serious defence of the legitimacy of skies in photographs, especially when printed from a separate negative. If I attempted to do so now I should only excite laughter, the practice of adding a sky is so universally accepted. The use of anything in photography used to be measured by the possibility of its abuse. The capabilities of any method when in skilled hands were seldom taken into consideration. The question always was: Is it possible for ignorance to go wrong with it? But if we measured every art by the mess that could be made of it by those who not only know no better, but seem to have no capacity for learning better, then no progress would be made in the world. It is pleasant to see a method I have always advocated universally adopted, but it is not so cheerful to see how the blunders that can be made with it still exist. It is pleasant to find that the practice has so far extended that even auctioneers' photographs of houses to let now have their natural skies; but it is vexing to see, as I did this morning at a railway station, a whole collection of these useful photographs with exactly the same sky used for each, and that without respect to the direction from which the light came. Photography, as I have often remarked, should be confined to the possible. Now I need not explain that it is impossible for the same clouds to exist in the same form in different parts of the earth; that no miracle in nature could produce the same sky effect exactly in separate places or on separate days. But this is not the lowest depth: I have seen in exhibitions photographs ascribed to various photographers, all of them with the same sky! There is no getting away from the fact that these photographers must have each bought their sky negatives, printed them, and unblushingly sent them to the exhibition under their own name! This is artistic immorality.

The sky is the commonest thing we have—it is always with us. It is so familiar to us that we seldom give it more than a passing thought. "It is a strange thing," says the author of "Modern Painters," "how little in general people know about the sky. It is the part of creation in which nature has done more for the sake of pleasing man, more for the sole and evident purpose of talking to him and teaching him, than in any other of her works, and it is just the part in which we least attend to her. There are not many of her other works in which some more material or essential purpose than the mere pleasing of man is not answered by every part of their organization; but every essential purpose of the sky might, as far as we know, be answered, if once in three days or thereabouts, a great, ugly, black rain-cloud were brought up over the blue, and everything well-watered, and so all left blue again till next time, with, perhaps, a film of morning or evening mist for dew. And instead of this, there is not a moment of any day of our lives when nature is not producing scene after scene, picture after picture, glory after glory, and working still upon such exquisite and constant principles of the most perfect beauty, that it is quite certain it is all done for us, and intended for our perpetual pleasure. And every man, wherever placed, however far from other sources of interest or of beauty, has this doing for him constantly."

A good deal that is suggested in the above still remains to be done. There is still room in our exhibitions for pictures in which the sky is made the principal instead of an adjunct. This I have mentioned in an earlier chapter; here it only remains for me to suggest to the student what to do, and especially what to avoid.

In many subjects, such as sea views and distant expanses of country, it would be easy to take the sky on the same plate as the landscape, and in seascapes it should always be done when fine effects can be secured; but it is seldom that the best pictorial results can be produced by this means. All skies that appear in nature are, of course, to some extent suitable to the views of which they are the background, but it does not follow that they are always the most picturesque, or conducive to pictorial effect; therefore all I have to say about obtaining the clouds on the same negative as the foreground, as some critics still maintain is the only legitimate way, is, get them if you can, and if the sky and foreground make an agreeable whole, be thankful, and exhibit the picture; but if it is not a pictorial success, then that sky must be sacrificed, and a more suitable one printed in its place. The method of obtaining sky negatives and printing them, have been so often described,* that it is not necessary to enter into any details here; but I would recommend the student to always secure a fine or useful sky whenever the chance occurs

* See "Silver Printing," by H. P. Robinson and Captain Abney.

to him. Never mind whether you see any immediate use for it: make a collection, and they will always be ready to select from. In taking your landscapes, always bear the sky in mind. If not a rule, it was at least a leading direction with the old landscape painters, that the landscape should fill up one-third or two-fifths of the picture, and the larger proportion be devoted to the sky. This will be conspicuously noticeable in the pictures of Wilson, Cuyp, Ruysdael, Hobbema, and others of the old masters; but photographers have found it best to nearly fill their pictures with their subject. The early practitioners were compelled to this, in a manner, by the difficulty of treating the sky, and they got rid of as much as they could of it; but our modern methods have changed all that, and we can represent the sky as perfectly as any other part of nature. But the practice of crowding the space with the subject by placing the horizon high up in the picture still survives. Let me recommend the student to try something different. Try a picture over a flat or slightly-undulating piece of ground, such as is to be found on almost all of our commons; if you can conveniently get a figure, or a cow, or sheep, or a cart and horse, to help to make up the picture, turn the camera towards the sun, of course shading the lens from the direct rays, and make a negative occupying about one-third of the plate. You will find that the sunlight, skimming along the upper edges of all the forms, produces a good and novel effect. Print this negative rather dark, filling the other two-thirds of the picture with a sky negative taken under the same conditions, but not necessarily at the same time, and if everything has been done well, you will find you have got a fine effect. I have recommended you in your first attempt to turn your camera to the sun, because the clouds in that position are often very beautiful in form, and strong in light and shade, and therefore more easy to photograph; but it will, of course, be understood that the sky is possible and generally beautiful in any of its phases as regards the sun, from morning to twilight. There are a few precautions that must be observed. The light must always fall on the clouds from the same direction that it falls on the landscape. Nothing could be more incongruous than a foreground lighted from the right, and the sky illuminated from the left. It is these departures from truth that bring discredit on our art. The sky should belong in character to the landscape, and should agree with and not fight against the view. If the objects in the view are important, the sky should be kept quiet: but if the subject is some very bold or striking cloud, then the landscape should be kept subordinate.

The state and character of clouds vary with the altitude at which they are formed. The visible sky consists of a graduated series of systematic forms of cloud, each of which has its own region and specific character.

Skies taken high up or looking toward the zenith should never be used near the horizon. Besides the variation in shape of clouds at different altitudes, they alter greatly according to their position in the sky; this is due to the effect of perspective; and there are some clouds, such as the cirrus, that are never seen except high in the heavens. Well defined clouds are seldom or never seen near a low horizon. Owing to the mist which always exists even on the finest days, the sky tends to plainness as it nears the horizon; this is especially noticeable over the sea.

Cloud forms are of great use in aiding and correcting composition. The great variety of lines and forms and masses of light and shade to be found in a good collection of sky negatives ought to enable the photographer to produce presentable results out of indifferent landscape materials. It sometimes occurs that the lines of composition in a scene are not what an artist would wish, and that no attention to point of view will materially improve the arrangement. A picture of this kind may be saved by a right use of a sky. Opposing lines may be introduced, and balance restored.

All this must be done with knowledge. This knowledge will come easy to the observing student, but it must be a knowledge of nature as well as of art. I hold it legitimate for the photographer to produce his effects by any means so that they are so true to nature that experts in nature shall not be able to deny their truth.

Correspondence.

TOURISTS' CAMERAS.

Sir,—Please allow me to second right heartily the sentiment of your "Cockney" contributor, that the usual tourists' cameras are good for everyone but tourists. The almost universal defect is, that the designers assume the time of the user to be of no value, and give him a multiplicity of screwings and adjustments to make and unmake over each view. I lose seven minutes in "putting up," and seven in "taking down," over each view—total loss, fourteen minutes. With three double dark slides, this means eighty-four minutes nearly—totally unnecessary waste of time over six plates, with great additional waste when the camera has to be turned on its side.

As the camera must have a case, there is no reason it should not be mounted inside that case, with the lens last used "in position," ready for employment again. Beneath the camera, inside the case, should be space for dark slides, and when the mounted camera is screwed close, the space in front of the lens can be occupied with a moveable leather rectangular receptacle, containing the extra lenses and minor necessaries.

The two ends of the case should pull out entirely, so as not to flap about when there is wind.

The front of the camera should first screw out, and the back afterwards, if necessary, to give power to use a lens of three times the length of the plate in focus.

The necessarily rigid parts of the camera can be skeleton framework, filled up with bellows work. The rigid parts of the case should be skeleton work, covered in with strong waterproof cloth.

I hope to see the day when all tourists' cameras, which are not ready for use when fixed by one screw on the top of the camera-stand, will be unsaleable.

Lucerne, February 19th. W. H. Harrison.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 14th inst., Mr. A. Haddon in the chair.

The Chairman said he would not detain the meeting with any introductory remarks, but call on Mr. F. W. Hart to deliver his lecturette on "Residues."

Mr. F. W. Hart, F.C.S., then read a paper (see page 115), during which he illustrated his remarks with various experiments, precipitating silver chloride from an old silver bath, dissolving an alloy in dilute nitric acid, and estimating the amount of silver therein by means of sodium chloride; also precipitating silver sulphide from hypo fixing-baths, by means of potassium sulphide (liver of sulphur). A sample of paper-ash was passed round, the lecturer preferring to store it in that form rather than allow large quantities of paper cuttings to accumulate. A small single fluid voltaic element was also shown, illustrating the gradual reduction of silver chloride to the metallic state in the immediate vicinity of the negative (silver) plate. This method was recommended for testing the value of small quantities when it is not desirable to treat the bulk; the resulting metal being weighed, dissolved in nitric acid, and estimated volumetrically. In reply to a question from Mr. W. M. Ashman, as to the strength of the chloride of sodium standard solution, the lecturer replied that it was empirical, suited only to the graduation of the instrument used. He did not think photographers were favourable to the French system of cubic

centimetres; they were far more familiar with ounces and drachms.

The CHAIRMAN: Mr. Hart has not mentioned the addition of spent developers to the fixing solution. Are they of any use to reduce the silver?

Mr. W. M. AYRES: Would not engineer's coke be better for furnace operations? It gives a more intense heat than ordinary gas coke!

Mr. F. YORK lately built a furnace to compare results obtained by sending his residues to the refiners, but had not gained much by it. For several years he had kept an account which showed that he realized fifty per cent.; a friend said he realized sixty-five per cent., and expected to get seventy; this induced him to try more accurately. He divided a batch into three equal proportions, reduced one portion himself, and sent the other portions to different refiners; the value of each was about the same in the end. His residues were collected in paraffine oil barrels. Two barrels are used; when the first one is full, it is allowed to precipitate, during the time the second is being filled. The same system is adopted with the fixing solutions. He wished to ask the lecturer why the various salts mentioned were employed in reducing; he never used any other than carbonate. What advantage was there gained by the addition of nitrate and borax? He thought the process of burning paper slow. He placed a perforated tin in the chimney, and burnt it very rapidly. Furnace coke was much better than gas coke. He also wished to know the object of adding sand to the flux?

Mr. A. COWAN: In reference to reducing ashes in small quantities, what gain is there? One refiner said it was a very great advantage to have a large proportion of salt mixed with the carbonates. Is that addition beneficial?

Mr. A. L. HENDERSON wished to know how the gold was recovered from a large quantity of residues; he sent gold and silver together to the refiners, and was allowed for each separately.

Mr. BARKER asked where the lecturer obtained his sulphide, he found, as a rule, the smell was abominable. He did not see any granules on examining the depositing arrangement. Mr. Hart's great experience would enable him to say whether the silver and chlorine are separated indiscriminately, or does one become positive and the other negative throughout the whole mass.

Mr. W. COLE: Has the method of reducing by the addition of glucose been tried by the lecturer?

The CHAIRMAN said the list of questions was sufficiently long, and called upon the lecturer to reply.

Mr. HART, in reply to the questions, said pyrogallol added to the fixing solution darkened it very much; he should hesitate adopting any process which would add obscurity to the solutions treated. He used coke of both kinds, when he got a refractory batch containing alumina. When the furnace is urged to the highest extent, he would use furnace coke always instead of the ordinary gas-coke; but in addressing photographers who are not professional refiners, he advised the kind which is easiest procured.

Mr. ADAMS: Carbon from broken retorts would be better still.

Mr. HART, continuing: It would be necessary to use a very high chimney to get such fuel to burn. Broken battery plates he mixed with ordinary coke, and burnt it. With regard to the per cent. recovered by Mr. York. Taking the value of silver as nitrate, and gold as chloride, he got, in his own operations, eighty-five per cent. Nitrate of soda is used because it is cheaper than potash. Mr. York should use soda ash. If Mr. York precipitated his chloride with hydrochloric acid, he could pour off the supernatant liquid in two hours. Borax is used when there is a suspicion of foreign metals. Boracic acid has a great affinity for the oxides of all the metals. The use of sand is to prevent burning a hole in the side of the pot. When added in a fine state, it acts on the alkaline flux instead of the pot. Salt is principally used in making assay when foreign matter is present. If only ten or fifteen grains of silver be put in, the mixture would be rendered so fluid as to be sure of getting every particle of the metal. The object in burning paper in small quantities is to lessen the bulk and the risk. Many fires have been caused by incautiously burning paper cuttings. Sulphide does not emit a disagreeable smell, if only so much is used as is actually required. Glucose is more expensive, therefore he did not think it worth while mentioning it. He kept his gold and silver residues apart, treating them separately; there was a loss otherwise. The theory of the depositing action was, that a current of electricity started at the zinc plate passed through the liquid to the silver plate, thence by the connecting wires to complete the circuit; in its passage through the liquid the molecules are decomposed, hydrogen is liberated on the negative plate, chlorine is displaced and the silver reverts to the metallic state.

Mr. BARKER: That does not answer my question.

The CHAIRMAN suggested Mr. Barker making an experiment for himself. The action would be seen to start at the positive pole, and gradually spread until all the silver is reduced.

Mr. ASHMAN: Would not a zinc plate alone be sufficient?

The CHAIRMAN: Yes.

Mr. AYRES preferred pouring the molten mass into a pail of water.

The CHAIRMAN said the best thanks of the meeting were due to Mr. Hart for the exhaustive manner in which he brought the subject before them. He moved a vote of thanks, which was seconded by Mr. Debenham, and passed unanimously.

It was announced that Mr. C. Darker would give a demonstration with the lantern on the 28th inst., illustrating the "Application of Polarized Light to Photography."

The next lecturette will be given by Mr. T. Bolas, F.C.S., on "Phototype Printing," March 13th.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

A POPULAR meeting of the Association was held in the Christian Institute, 70, Bothwell Street, on Wednesday, the 6th inst., Mr. JOHN PARKER, Vice-president, in the absence of Councillor Robertson, in the chair.

The feature of the evening was a magic lantern exhibition, arranged and manipulated by Mr. Thomas Swan.

A very fine series of twenty transparencies from one negative, showing the multitude of pleasing tones which may be got in transparencies, by Mr. Alex. Cowan, of London, was very much admired.

Mr. L. DIXON, of Colne, exhibited some collodio-chloride transparencies printed by contact, most of which were very fine.

The other contributors were:—Messrs. York, Woodbury, England, Wilson, Lang, &c.

There was a very large turn-out of members and friends, and the meeting terminated with votes of thanks to the contributors of transparencies, and to Mr. Swan.

LEEDS PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting was held on Thursday, February 6th, the President, Dr. THORPE, in the chair.

Mr. J. W. REFFIT introduced the subject of photographic enlarging, with a demonstration of direct enlarging upon gelatino-bromide paper. In introducing his subject, Mr. Reffit said that he thought a short outline of the various enlarging processes would be of interest to the members, especially those who had recently taken up photography. Daguerreotype or photography on a polished silver surface was introduced in the year 1839. In the same year Mr. Fox Talbot brought out his invention of making paper negatives, from which any number of positive copies could be obtained. This paper was very sensitive to light. In 1851 Scott Archer published the collodion process, by which the photographic image was produced on glass, and from this time photographers began to exercise their ingenuity in finding out the best means of enlarging photographs, in consequence of the many difficulties and drawbacks in taking large photographs direct. Having photographs on glass by the collodion process, and Fox Talbot's process of preparing very sensitive paper by means of iodide of silver, it needed but little ingenuity to adapt the well-known magic lantern to the production of enlarged photographs. [Mr. Reffit here illustrated his remarks by going through in form the various processes of taking a small ¼-plate portrait, developing and enlarging the same to life size.] One of the means employed in addition to the lantern was the solar camera or lantern, as introduced by Woodward. This was not extensively used in this country on account of the small amount of actual sunshine. Paper enlargements thus produced were very permanent. Mr. Harrison, a well-known Leeds photographer, had exhibited two such enlargements in his window, exposed to the direct rays of the sun for twenty-five years, and they showed no traces of fading. Enlargements on iodide of silver paper were largely employed for enlarged portraits to be finished in crayon, water-colour, or oil. Messrs. Winter, Bros., of Vienna, using a similar process for enlarging on calico, do a large business in enlarged portraits, for

artists using the electric light as an illuminant. Another process was to make an enlarged negative from a small albumenized paper print, or from a print by the Platinotype process. Specimens of both were exhibited, the copy from the Platinotype print showing little or no effect of grain of small paper photograph. Good results were obtained by making a transparency by carbon, dry collodion, gelatine, or gelatino-chloride by contact with negative, and the enlarging by means of the copying camera and daylight. [Mr. Reffitt then exhibited a copying camera, and described various arrangements for enlarging—such as horizontal window arrangements, vertical skylight, with table underneath to receive image, &c., &c.] An enlargement could also be made by making an enlarged transparency on glass of size required, which could be touched up to improve as much as possible, and then copied by contact on dry collodion, gelatine, or carbon. A method extensively practised amongst those who did a trade in club portraits was to clean a plate of glass, which, after dusting with talc or French chalk, was collodionized, sensitized in silver bath, exposed with small negative in copying camera, and developed to a less degree than a lantern slide. A plain sheet of paper was coated with gelatine and squeegeed upon film. After drying, the picture was stripped from the glass and mounted. Messrs. A. and G. Taylor, of Forest Hill, do a large business in this class of enlargements, employing twenty-four copying cameras, fitted with twenty-four of Dallmeyer's No. 1B lenses. Mr. Reffit mentioned that he had a letter from the late Mr. Dallmeyer, in which Mr. D. recommended the B series of lenses as the most suitable for enlarging, and he also suggested that four diameters was the extent to which enlargement should be carried. Enlargements on gelatino-bromide paper were easy to make, and its introduction by Messrs. Morgan, Hutinet, and others, would do much to make enlarging popular with amateurs. The paper being very sensitive, enlargements could easily be made with a lantern and paraffine lamp. Mr. Reffit then demonstrated the process of enlarging upon gelatino-bromide paper, using an optical lantern and four-wick lamp, and with three minutes' exposure succeeded in producing a very fine enlargement, size from a quarter plate negative to 23 by 18 inches. Mr. Reffit's paper was fully illustrated by means of diagrams, apparatus, specimens of enlarging, and enlarged negatives by all the processes mentioned.

Messrs. Teasdale, Thorpe, Holmes, and Thornton took part in the discussion that followed.

The following articles were exhibited:—Small pocket camera with attached plated box by Mr. Watson, of Hosforth; instantaneous shutter by Mr. Bradford; instantaneous shutter by Mr. Branson; adaptable carrier, for unmounted lantern slides, by Mr. Teasdale; gelatino-bromide enlargements by Mr. Rodwell; a very fine carbon enlargement by Mr. Ramsden.

The next meeting, Thursday, March 6th, will be an open lantern night. Members wishing to send slides for exhibition must send particulars of them, processes by which they were taken, &c., to the Secretary, 22, Carr Road, Leeds, not later than March 4th.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE fourth meeting of the Society was held in 5, St. Andrew Square, on Wednesday evening, February 6, Mr. WILLIAM NEILSON, President, in the chair.

The following gentlemen were elected ordinary members:—Messrs Daniel Finlayson, F.R.P.S., Andrew Forbes, Edward Debenham, Julius Peike, W. S. Anderson, and Hunter Muir.

Mr. T. D. POPE gave a demonstration of his mode of producing gelatino-bromide enlargements on paper. Two very successful enlargements were produced of good colour, which were brilliant, yet soft. In the course of the demonstration, Mr. Pope said it was imperative that every attention should be paid to cleanliness and careful washing between development and fixing, in order to avoid stains. While the paper is dry, it is very liable to receive stains from damp fingers. He particularly recommended that the developer be poured into the dish, and the exposed paper, previously soaked in water, floated thereon, face down, as the plan usually recommended, of pouring the developer on the print, in his hands, tended to produce unevenness and stains. When the image was fairly visible, then turn it face up. In practice he had a piece of white cardboard nailed on the wall of his operating room with the various sizes marked on it. The image, thrown on the desired space from a lantern, was duly focussed to the required size; the light then being turned down, a piece of dry argentic paper was tacked on the space, and the exposure proceeded with. He preferred negatives of moderate density—not too thin, but with clear shadows. The time of exposure could only be learned by experience, the quality of negative and power of light being the chief factors. The following was the formulæ employed:—

No. 1.—Oxalate of potash	... ...	6 ounces
Boiling water...	... ...	30 ,,
No. 2.—Protosulphate of iron	...	2 ounces
Water...	...	10 ,,
No. 3.—Citric acid	... ...	3 ounces
Water...	...	10 ,,
For use taken of No. 1.	... ...	8 ounces
,, No. 2.	... ...	2 ,,
,, No. 3.	... ...	½ ounce
Fixing:—Hypo	... ...	12 ounces
Water	... ...	40 ,,
Fix twenty minutes.		
Hardening bath:—Alum	... ...	2 ounces
Water	... ...	20 ,,

Mr. SAMUEL TAMKIN said his experience fully supported that of Mr. Pope's, in that greater freedom from defects resulted from floating the paper in development, and also advised that dishes only a very little larger than the paper should be employed. He handed round a large number of bromo-argentic paper prints with duplicate on ordinary albumenized paper. It was noticed that in some cases the bromide prints were the most suitable expression of the subject. In reply to question he said the difference in tone was due to modifications in the developer. The cold bluish green tone was got by the use of that generally employed, viz.:—Saturated solution of oxalate of potash, three ounces; saturated solution of proto-sulphite of iron, one ounce. He understood that an excess of iron caused yellowness; he therefore increased the proportion of oxalate, and gave a much longer exposure. By this means the prints developed as quickly as well-exposed dry plates, the colour was better, and the whites were remarkably pure. He found it of great importance to time the exposure correctly, for though a great deal is said about the latitude allowable in this as in the working of gelatine plates, in neither should the best results be looked for unless the exposure had been correctly timed. It was in this that a thorough knowledge of the proper qualities of a negative became of value, because with such knowledge an operator might produce dozens in succession without a failure. It is always advisable to immerse or float the wetted paper face down in the developing dish as mentioned by Mr. Pope. When small work is attempted, great care is necessary in the mounting and finishing, as the surface is much more liable to injury than albumenized paper. He had found prints lost brilliancy by being burnished.

Mr. M'KEAN believed a six-inch condenser ought to be employed.

Mr. TURNBULL said no advantage would be gained by a six-inch condenser for carte work; in fact, such a size would be a positive disadvantage.

A vote of thanks to Mr. Pope, proposed by Mr. Craig-Christie, was carried by acclamation.

A discussion on "Canary Medium" then took place, initiated by Mr. Knolles (see p. 119).

Mr. Bow said he had found the ruby lamp too trying, and he was endeavouring to devise a substitute. The result of his experiments he hoped to embody in a paper, which he promised to bring before the Society at an early date.

Mr. TAMKIN had tried the "Canary," and was not satisfied with it. He found three thicknesses of pale yellow tissue paper was really better—his window was not under influence of direct sunlight.

Mr. BASHFORD said that by the courtesy of Mr. Scorah, of Bradford, he had been enabled to distribute samples of canary medium to several members, and laid pieces on the table for others who might care to experiment with it. He thought that the opacity of the paper played an important part in its usefulness, as, according to Mr. Knolles, the medium was unsafe if oiled. There was no doubt, however, that the illumination was most pleasant, and with two thicknesses Mr. Knolles had shown it was quite safe, the negatives and transparencies produced being entirely free from fog. He drew the attention of experimenters to a statement by Mr. A. L. Henderson, that though the light when examined by a spectroscope might exhibit a decided green, yet it might be quite safe for the dark room. He also noticed that some experimenters had endeavoured to arrive

at a solution of the difficulty by taking negatives of surfaces covered by various pigments. These thought that the least actinic pigment ought to indicate the safest colour, and be a guide to judge of the sensitiveness of plates. He thought experiments in that direction were likely to be misleading, and believed that pigments ought not to be compared with the colours as seen in nature; their action on sensitive surfaces was entirely different. He considered it an easy matter to produce the most contradictory evidence when the pigments of the artist's colourman were employed, but the photographer generally had to go direct to nature, and it was only by experimenting with nature's colours or their equivalents that the photographer would be materially benefited.

Mr. TURNBULL exhibited a modification of Mr. M'Dougall's lantern carrier, in which the parallel sides were made of metal instead of wood, thus allowing this ingenious contrivance to be sufficiently reduced in width as to render it applicable to the sciopticon. He also exhibited Cadett's new exposure shutter.

Mr. Wardale presented the Society with a non-actinic lantern of new design for use in demonstrations.

The thanks of the Society were presented to Mr. Wardale, also to Mr. Knolles, for his carefully conducted experiments, and the meeting terminated.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.

THE usual ordinary meeting of this Association was held on Tuesday evening, the 12th instant, in the College of Physical Science, Newcastle, Mr. A. L. STEAVENSON, J.P., of Tynemouth, in the chair.

Mr. E. DODDS read a paper entitled "Notes on Ruby Light." He said that he had confined his attention principally to the testing of various coloured media suggested in the photographic journals, &c., and had decided in favour of ruby glass. He, however, showed in a lantern brought for the purpose, several variously-coloured glasses and papers, some of which were highly suitable, the best of them being Mr. W. E. Debenham's cathedral green, combined with rag yellow paper, and a stained red glass combined with a saffron-coloured parchment paper.

Mr. J. P. GIBSON observed that he used cherry fabric, but always with artificial light.

Prof. HERSCHEL said that he had nothing to offer from experience regarding the relative values of the different kinds of non-actinic colours which had been exhibited to them that evening for dark-room illumination. The non-actinic property depended so much upon the nature of the chemicals used, as well as of the light tested, that it must be in great measure a subject for experiment with different sensitive plates. But the exact measurements to which Mr. Dodds had submitted them showed very clearly that for manipulations of ordinary dry plates there was a large choice of very different looking colours, of which several were almost equally harmless and inactive. Regarding the fatiguing effect of ruby-glass light upon the eyes, the complaint against it was, probably, in some degree well founded, as its low refrangibility must lengthen the visual focus distances of objects examined by it, so as to make it necessary either to hold such objects at a greater distance than usual from the eyes, or else to strain the adapted muscles of the eye to bring a distinct focus on the retina the image of such objects when they are held close at hand; and especially when they are so closely examined and inspected as we are accustomed to do by holding them very near the face, in ordinary light, for minute discrimination. Short-sighted persons have a natural advantage over those whose usual sight is either normal or long focussed in the power of minute observation; and in ruby light such persons would feel at home, or would at least be on a level of scrutinising aptitude and ability with ordinary-sighted persons in ordinary light. Normal-sighted persons, on the other hand, would feel as if the long-sighted infirmity natural to old age had overtaken them before its time, obliging them either to forego the advantages of close inspection, or to strain the focussing muscles of the eye fatiguingly to require the faculty of distinctness of sharp-focussed definition stolen from their vision by the light when attempting to enlarge the view of an object in the usual way by looking at it closely. The young generation of normal-sighted photographers will, no doubt, be led, by a prevailing use of ruby glass, to give the focussing muscles of the eye exceptional exercise in one particular direction. This will either (if over practised) tend to make them short-sighted for ordinary light, or if only exercised enough to extend and not to displace the range of muscular efficiency, will furnish easy early training in an useful means of mitigating the usual tendency to deterioration of the eye-sight; and it will prepare eyes so exercised in youth to combat more successfully than untried eyes could do the infirmity of vision natural to old age, and the defect of long-sightedness which normal eyes acquire sensibly even in the advancing years of mature life, without making it necessary to hold a page of print at arm's length, in order to see its letters clearly. A moderate use of ruby light, although somewhat fatiguing to normal eyes, must, accordingly, be rather likely to have a wholesome and invigorating than a deleterious and injurious effect upon the sight. It would be a useless light, however, for colour-blind persons; and the sense of red colour in normally-constituted eyes, it may be conjectured, would be quickened and heightened at the same time, without disadvantage, with the extended power of focus-adaptation. But a great range of other colours, not ranking nearly so low in refrangibility as ruby-red, it has been shown clearly by Mr. Dodds' illustrations and experiments, is open to selection and to adoption in a dark-room with perfect safety, by those who may be averse to suffering the feeling of inconvenience sometimes occasioned by the bright red, even if its trying effect on the eyes should be closely proved to be not only harmless, but, in reasonable limits of exposure to it, of useful service and ultimate benefit to their efficiency.

The CHAIRMAN proposed a vote of thanks to Mr. Dodds for his paper, which was carried with acclamation.

The SECRETARY exhibited and described a camera, sent for that purpose, by Mr. McKelleu, of Manchester.

Some fine transparencies were shown by Messrs. Mawson and Swan, taken on gelatino-chloride plates of their own manufacture.

Mr. DODDS proposed a vote of thanks to the Chairman, who, in reply, expressed the pleasure it had given him to be present on that occasion. He regretted that he could not come oftener to the meetings, which he said were always instructive.

THE second annual dinner of the above Association was held in the County Hotel, Neville Street, Newcastle, on Friday last, the 15th instant. Professor Herschel presided, and was supported by Mr. Way, Mr. Payne, Mr. Pike, and others. Mr. Garland occupied the vice-chair, and was supported by Mr. Ross and other members of the Association.

The CHAIRMAN proposed the usual loyal toasts, which were drunk with enthusiasm.

Mr. WAY gave the toast of "Photographic Art and Societies," and spoke of the value of an art education.

Mr. GIBSON responded.

The VICE-CHAIRMAN proposed "The Newcastle and Northern Counties' Photographic Association." He deprecated the art jealousies which seemed to exist among even our great men. He thought that there should be more generosity of disposition shown towards students by those who had made a life study of art. A different spirit prevailed among Continental artists, from whom our native painters had derived a good deal of their knowledge of art. He trusted their Association would tend to break down the spirit of exclusiveness which prevailed, and the fear, so to speak, that their ideas or knowledge of art might be acquired by anybody else. Our countrymen in the past had experienced no such narrowness or jealousy from the old masters, and Englishmen should be more willing than they were to hand down to those who aspired to follow them, all the knowledge of the art they could for the benefit of posterity.

The CHAIRMAN responded.

Mr. ROSS, in a few well-chosen remarks, proposed the toast of "The Officers and Committee of the Newcastle and Northern Counties' Photographic Association," which was responded to by Mr. Laws, Mr. Pike, and Mr. Sawyer.

Other toasts followed, and the proceedings were pleasantly interspersed with songs and pianoforte and violin solos, the instrumental music being contributed by Mr. A. de Pelsenaire and Mr. H. Sawyer.

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Association was held on Tuesday, February 12th, Mr. HUGH REID, President, in the chair.

After the reading of the minutes of the last meeting, the following new members were elected:—Messrs. Downie, Bischoffhousen, Chalmers, W. Millar, Garroway, and J. Barr.

The PRESIDENT proposed that the Association purchase a

quantity of trays, measures, a lamp, and other apparatus, to be used at meetings when practical demonstrations were given, and the council were directed to carry out the proposal.

Mr. T. N. ARMSTRONG then read papers on "Mounting Prints on Glass," and on "Transparency Printing." For mounting on glass, he used starch, first coating the glass, and then the damp print, and squeegeeing the two together. He found the use of the squeegee much facilitated by coating the back of the print with starch, which acted as a lubricant, preventing the prints from being torn. He had tried gelatine, but found the starch method simpler, and quite as satisfactory in result.

After Mr. Armstrong had given a successful demonstration of the process,

Mr. J. Y. MCLELLAN suggested that the addition of oxgall to the starch would make it take more kindly to the polished surface of the glass.

Mr. FALCONER enquired if a mixture of starch and gelatine had been tried?

Mr. JOHN PARKER said he had used the gelatine process for a number of years, and was quite satisfied with it, preferring it to the starch method demonstrated by Mr. Armstrong. He found no difficulty in the gelatine setting too rapidly, as, during the operation of mounting, he kept the glass over a dish of boiling water, the heat from which prevented the setting of the gelatine. He thought there was greater transparency in gelatine, and that it was less liable to decay than starch. Further, there was the advantage that, if necessary, the gelatine could be rendered insoluble by brushing the back of the print with a solution of chrome alum. He used a weak solution of gelatine, and, instead of applying it with a brush, immersed the print entirely in the solution.

Mr. ARMSTRONG said he had tried a mixture of starch and gelatine, but found no advantage over pure starch. He thought starch was less liable to decay than gelatine, especially in cases where the print might be subjected to damp.

Mr. ARMSTRONG then gave a demonstration of transparency printing by contact and through the camera, using gelatino-chloride and bromide plates.

After a hearty vote of thanks to Mr. Armstrong, the meeting adjourned.

BOLTON PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held at the Baths on the 7th inst., Mr. E. N. ASHWORTH in the chair.

The minutes of previous meeting having been read and confirmed,

Mr. MCKELLEN, of Manchester, explained the principles and details of his new camera. There can be no doubt that the inventor has overcome many of the difficulties and inconveniences of the old style of camera, and has secured lightness and compactness without sacrificing rigidity.

Mr. JOHN TAYLOR gave a very instructive explanation of the different modes of enamelling silver prints, and showed the process from the cleaning of the plates to the stripping of the finished print.

Mr. C. K. DALTON gave the paper on "Platinotype Printing" which he had promised for the previous meeting. Mr. Dalton is a very clever manipulator, and his demonstration was one of the best of the season. His method and neatness were very conspicuous, and showed at their best the beauties and simplicity of the process.

Mr. HARWOOD had promised to give a lantern exhibition, but being unavoidably detained, Mr. Thos. Parkinson very kindly officiated.

The Platinotype Company kindly lent to the meeting a number of samples of their work, which afforded another enjoyable element in a very successful meeting. It was now getting late, and the further business was postponed, and the proceedings brought to a close by a cordial vote of thanks to all who had assisted in securing one of the best attended meetings the Society ever had.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next meeting of this Society will take place on Tuesday next, February 26th, at 8 p.m., at the Gallery, 5A, Pall Mall East when the evening will be devoted to an examination of transparencies by the Society's oil lantern.

THE ALLEGED FRAUDS BY A CANVASSER.—The club agent recently charged at the Brighton Police Court with defrauding Messrs. A. and G. Taylor (see page 104) has been committed for trial at the next Borough Quarter Sessions.

BOOKS ILLUSTRATED BY SPRAGUE'S INK-PHOTO PROCESS.—We have received "Luther Miller's Ambition" and "Two Saxon Maidens" from the Wesleyan Sunday School Union, the illustrations being reproduced by Messrs. Sprague and Co. from the pen-and-ink drawings of the artist. The special advantage is the perfection with which weak or broken lines are reproduced.

MESSRS. BROWN, BARNES, AND BELL.—A proposal is made to transfer the business of this firm to a joint stock company, having a capital of £130,000, and it is now intended to issue shares to the extent of £30,000. It is evident that the promoters of the company look to the development of the photo-filigrane process and the manufacture of phototype blocks (Luxotype) as main factors in the success of the proposed Company. Together with the prospectus of the new concern, we receive a long list of general press opinions as to the value of these methods. The *City Press*, *Fife News*, two Manchester papers, five Liverpool publications, two Sunderland papers, and the *Birmingham Owl* are quoted as testifying to the value of the filigrane process; but we do not find the opinion of a single photographic authority referred to. With respect to the Luxotype the case is different, as we not only find the testimony of *The Rock*, *Bell's Life*, and one or two other metropolitan papers as to its value, but the opinions of no less than sixteen provincial papers; and in addition to these, a most flattering notice from a technical journal, *The Photographer*: still we do not quite know which publication is referred to. Can it be the Russian journal *Photographer*, or Mr. E. L. Wilson's ably conducted *Philadelphia Photographer*? Those who are interested in photo-block methods will find some details in our YEAR-BOOK, pp. 25, 78, and also several examples of photo-typographic engraving.

PHOTOGRAPHIC CLUB.—At the next meeting, on February 27th, the subject for discussion will be "On the Preparation of Lantern Slides." As this will be a lantern evening, members and visitors are invited to bring slides.

To Correspondents.

*** We cannot undertake to return rejected communications.

A. M. S.—1. It is well adapted for use with all qualities of gelatine plates, but a little judgment will be required in adjusting the proportion of No. 3 solution. 2. The time required depends mainly upon the hardness or softness of the gelatinous film, and it may, assuming the correct exposure to have been given, vary from the tenth of a second to several minutes. As a general rule, the image will appear more quickly when the developer is made up with soft water than when hard water is used. 3. If under-exposed, increase the proportion of No. 3; but if an unduly long exposure has been given, do the reverse. 4. Use the largest stop, which will give you the required definition all over the field. 5. We cannot tell, and it appears to us that there would be nothing gained by enquiring. If, however, you wish to communicate with the gentleman named, and will send a letter for him to our office, we will forward it. 6. We are sorry that we could not see our way to give you the above information by means of a private letter, as we only do this when an early answer is of special importance, or it may be undesirable to answer in this column. Your stamps have been returned. Write to us again if you require further information.

VANNIN.—Dagron, of Paris, supplies them, and we have no doubt you could obtain them to order from Messrs. Marion and Co., of Soho Square.

J. H. R. S.—Under the circumstances we will do nothing, although we had intended to make enquiries as to the reason of the delay.

G. MACKIE.—1. A weak solution is to be preferred, as it enables one to keep the reaction better under control. About ten grains to an ounce is a convenient strength. 2. If too much is added, it will completely coagulate even if warm, but only enough should be employed to produce the faintest symptoms of thickening. 3. The amount of acetic acid required will depend altogether on the quality of the gelatine. It is not desirable to use more than enough to restore the original fluidity of the mixture. 4. All can be done in daylight up to the point at which the emulsion is applied.

C. P. GIBSON.—The sensitive paper is exposed together with the printing frame containing the negative and tissue, until such a tint is impressed on the sensitive paper as experience has shown to be sufficient; the scale of tints round the circular opening affording a standard for comparison. For very long exposures, a piece of thin orange gelatine is placed over the sensitive paper. When the instrument is used for camera work, it is exposed in the direction of the proposed view, and the time required to impress a given tint is noted. The exposure given is long or short, according to the time required to give the standard tint. By enclosing stamps, you gave us the unnecessary trouble of returning them.

ALPHA.—I. You can obtain it from Mr. Cornelissen, 22, Great Queen Street, Drury Lane, London. 2. Richmond's Grammar of Lithography, published by Wyman. We believe it costs four or five shillings. 3. No, the pressure method will give a much better result. 4. The copying press will answer very well for early experiments. Cement a piece of thick plate glass to the bed, and another to the platen. 5. Fine Rives paper is used, but it requires to be coated with an alkaline solution of lac, and very carefully rolled. If you require further information, write again.

G. WILSON.—We have done as you requested.

L. S.—The address of the patentee has been forwarded to you.

W. DAVEY.—Dr. Liesegang's book is in German and costs half-a-crown. If you send a P. O. O. for 2s. 9d. to Dr. Liesegang, Dusseldorf, Germany, we have no doubt you will receive it by return of post. The title is "Photographische Schmelz-farben-bilder." See also an article which appeared on page 241 of our volume for 1882.

J. BALDWIN.—A pickle of bichromate of potash and sulphuric acid removes the films very effectually. One part of bichromate in twenty of water, with the addition of two parts of sulphuric acid, answers well.

THOS. STOKOE.—Thank you for the picture; the idea is an excellent one.

T. H. HUTCHINGS.—The Eastman machine is figured on page 564 of our volume for 1883: also on page 188 of the YEAR-BOOK.

DRY PLATE.—1. It is extremely difficult to manufacture gelatine perfectly constant as regards quality, and although both kinds mentioned will answer well, we have of late obtained better results with No. 2. 2. It makes not the slightest difference whether the water in the external vessel boils gently or violently; all excess of heat being consumed in converting the water into steam. Many have met with the same difficulty, but in every case which we have investigated, the failure has either arisen from the over-heating of the mixture, or by traces of partly decomposed gelatine from previous workings finding their way into the emulsion. When ammonia is used, extra care must be taken to guard against accidental contamination by dirty vessels. Stirring with a stick which has been previously used will often deteriorate a large batch of emulsion, merely causing thin images in one case; while in another instance, green fog may ensue. Violent agitation has, as far as we know, no mischievous action. 4. You are quite right, as after a certain point the grain becomes much coarser without a corresponding increase of sensitiveness. Try the ammonia process once more with additional care, and we are convinced you will obtain first-class results.

W. ORCHARD.—We are glad you have been so fortunate, and we can understand that you have no wish to make a change.

M. J. ADCOCK.—Registration will not do, you must take out a patent. At a cost of £4 you can obtain a patent good for four years. See article on page 754 of our volume for 1883.

ANXIETY.—1. The best way is to paint the back of the plate with a bituminous varnish, such as Brunswick black. Yes. 2. It may be useful in some cases, but we do not ordinarily employ it.

F. BARRETT.—1. The spots appear to be due to hyposulphite in the mount. Read leader on the subject in present issue, and try the experiments referred to, and if you find proper grounds for doing so, make a claim against the dealer who supplied them. 2. The developer cannot readily reach those parts which have received the fullest exposure, and it exhausts itself upon the less vigorously impressed portions. You should use very thinly-coated plates, and an emulsion containing a minimum of gelatine. 3. No, just the same exposure as if done in the usual way. 4. Replace the spring by four weaker ones—one for each corner of the plate.

SPOTS.—1. They appear to arise from the presence of hyposulphite in the mounts. See answer to F. Barrett, as your mounts appear to be of the same make as his. Probably you had better consult a solicitor. 2. It is annoying, but we do not know of any remedy. 3. In some cases we have found its use to be advantageous.

TROUBLESOME LAD.—Grind the dry colours with white of egg, and apply the mixture with a brush in the usual way. The flat portion of a glass stopper answers very well as a muller. When the work is dry, apply a few drops of alcohol to render the albumen insoluble. 2. The only way is to apply the adhesive material to the edges only; the central part being protected by a cut-out disc during its application. 3. There is none.

J. I.—1. We think that about £1,000 may be somewhere near the mark; providing, of course, that we have not misunderstood your statements. Still you must remember that we express no decided opinion. 2. Some of the pictures are very pleasing.

DAMP.—It makes but little difference whether you use the gelatine in the form of size, or whether you commence with dry gelatine. If the former, we would suggest melting four pounds of size, and stirring in three ounces of finely-powdered bichromate of potassium. The mixture should be used as soon as the bichromate is dissolved, as it is extremely liable to become insoluble. If you use solid gelatine, do not take such a low quality as common glue, but employ a cheap hard flake gelatine, which can usually be bought for about one shilling a pound. Dissolve one pound of this in three pounds of water, and stir in the above-mentioned quantity of bichromate.

A. M.—It is very difficult to form an opinion, as we do not know all the circumstances, but we are inclined to think that the mischief arises from some peculiarity in the quality of the paper used; try another sample. It is important to allow the prints to remain for a sufficient time in the fixing bath; and the solutions should be freshly made.

The Photographic News Registry.

Employment Wanted.

Recep. Room, Mounter, &c.—M. W., 68, Parma-cres., Clapham Junction.
Printer or Gen. Assist. (young man).—Evans, 9, Church-st., Folkestone.
Reception Room, Mount, Spot, Books.—F. W., Chryssell-rd., Brixton-rd.
Printer and Toner.—Printer, 24, Crick-st., Burdett-rd., E.
Operator, Retoucher, Enlarger.—Alpha, 115, High-st., Camden-town.
Artist, well up.—P. Eckhart, 105, Hall-pl., Hall-pk., Paddington.
Retoucher and Colourist (lady).—J. J., *Photo. News* Office.
Artist, medallist.—Miss A. H., 88, Stoke Newington-rd. N.
Operator or Manager.—A. E. Walker, Eastwood, Notts.
Assist. Printer & Vignetter.—G. E. Cann, Market-st., Brighton.
Assistant Operator, or Manage Branch.—H. W., Finsbury-circus, E.C.
General Assist., good all round.—X. Y. Z., 49, Ledbury-rd., Bayswater.
Assist. Op., &c. (town only).—C. H. E., 50, London-st., Tottenham-ct.-rd.
Assist., can print, tone, paint enlarg.—Silver, 40, Gower-st., Birmingham.
Assist., enl. on Morgan's pap.—F. P., 16, Rochester-sq., Camden-rd., N.W.
Assist, retouch heads for publication.—Retoucher, *Photo. News* Office.
Reception Room, as Improver.—X. Y. Z., 5, Jesse-ter., Reading.
Assist. Operator, could manage.—F. B., 2, James-st., Iffley-rd., Oxford.
Reception Room or Shop (Lady).—A.S., 77, City-rd., N.
Operator, wet or dry.—C. O., 25, Duke-st., Bloomsbury.
Retoucher, first-class.—Artist, 15, Hastings-st., King's Cross, N.W.
Artist in Oil and Water.—J. J. Gibson, 32, Pembroke-sq., Kensington. W.
Op. & Ret., wet or dry.—F. J. M., 6, Brockham-ter., Willsbridge, nr. Bristol.
Operator and Retoucher.—Alpha, 10, Hotspur-st., Kennington-rd., S.E.
Retoucher and Min. Artist.—Miss Lea, 443, Coldharbour-la., Brixton.
Silver Printer and Toner.—F. C. M., 35, Vincent-sq., Westminster.
Gen. Assist., all round.—G. L., 49, Ledbury-rd, Bayswater, W.
Op. & Retoucher, 50/- weekly.—H. H., 146, Cheetham-hill, Manchester.
Gilder, Joiner, Fitter-up.—A. J., 31, Charles-st., Southboro', Kent.
Printer, generally useful.—F. Foy, 7, Market-st., Deal.
Finishing Enlargements at home.—L. E., Spring House, Merton, S.W.
Operator, land., portrait., monoch, crayons.—W. D., Shaw-rd., Dudley.
Reception Room, Shop, Mount, finish, &c.—B. A.. *Photo. News* Office.
Col. & Ret. (Lady).—E. McCowen, 20, Grand Parade, St. Leonard's-o-Sea.
Retoucher, Operator, Printer.—V. C. Yealett, 3, Queen-sq., Bath.
Manager, exp.—Photographer, Adelaide-rd., St. Paneras, Chichester.
Operator, Copyist, clever with children.—C. O., 25, Duke-st., Bloomsbury.
Retoucher, first-class, in London.—Artist, 15, Hastings-st., King's Cross.
Operator, can speak French.—G. P., 4, Stamford-st., Blackfriars-rd., S.E.
Retoucher, first-class.—P. Marks, 1a, Britannia-st., City-rd., E.C.
Retoucher, work at home.—J. Fisher, 7, Westmoreland-pl., City-rd,, E.C.
Shopman, town preferred.—E. D., 17, Brunswick-st., W.C.
Operator & Retoucher.—Light, 94, D Street, Queen's-pk., N.W.

Employment Offered.

Silver Printer and Toner (good).—W. Wilson, 77, De Beauvoir-rd., N.
Photo-Lithographer & Photo-Etcher.—Meek & Co., 4, Cable-st., Liverpool.
All-round hand, wet & dry.—Tune & Co., Warrington House, Tottenham.
Retoucher of first-class ability.—H. W. Winter, Alexandra Rooms, Derby.
Printer, first-class, to Manage.—Byrne & Co., Richmond, Surrey.
Printer & Toner, dry-plate.—H. Friedmann, The Grove, Stratford, E.
Assist. Landscape Printer.—Carl Norman, Graphic Villa, Tunbridge Wells
Operator for Ireland.—D. W., c/o Marion and Co., Soho-sq.
Printer, young and clever.—J. S. Catford, Art Gallery, Ilfracombe.
Assistant Operator immediately.—P. G , c/o Marion & Co., Soho-sq.
Operator, clever, for three months.—Silas Eastham, Southport.
Retoucher, three days a week.—J. S. Bayfield, 10, High-st., Notting-hill.
Retoucher, clever.—John Hawke, George-st., Plymouth.
Assist. Oper., first-class Retouch.—Disderi & Co., 4, Brook-st., Hanover-sq.
Out-door dry-plate Operator.—R. Ward & Co., 166, Piccadilly.
Sil. Print. & Ton.—Mrs. Harborne, 300, Victoria-rd., Aston, Birmingham.
English Lady for France (shop).—E. E. Y., 24, Mark-la., E.C.
Out-door Operator, Monochrome, Retouch.—A. K., *Photo. News* Office.
Operator, generally useful.—A. H., 68, Fullerton-rd., Wandsworth.
Operator, first-class, for City firm.—J. B., *Photo. News* Office.
Assist. Printer, good Vignet.—J. Ruckmann. 5, Watfield-rd., Ealing Dean.
Operator for Ireland,—D. W., c/o Marion and Co , Soho-sq.
Artist, for black-and-white.—G. N., 118, High-st., Notting Hill.
Printer and Toner, first-class.—Cobb and Son, Wellington-st., Woolwich.
Printer and Toner, to manage.—Vander Weyde, 182, Regent-st., W.
Collotype Printer, Woodburytype, &c.—X. X., 38, Poultry, E.C.
Artist, skilful, at 50/- per week.—Winter, Derby.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1330.—*February* 29, 1884.

CONTENTS.

PHOTOGRAPHY IN EASTERN ASIA.

BARON STILLFRIED, an Austrian, who has had twenty years' experience of travel in Siam, China, Japan, and other Eastern countries, has just returned to Europe, and has brought a rich and varied collection of photographs to Vienna. In the first place, he travelled as an amateur photographer, but he ultimately made a profession of the art.

Stillfried makes very interesting observations as to the position of photography in Eastern countries, and he says that the first photographer settled in Siam about 1857. He was a missionary, and he first converted a native to Christianity, and then taught him photography. This convert is still in Siam, and is neither a good Christian nor a high class photographer; still, he turns out his work at so low a price that no European can compete with him.

The Chinese are far more industrious than the Siamese, and after the late war of England and France with China had terminated, several professional photographers settled down in the celestial empire and took native assistants; but ultimately the assistants commenced on their own account, and at the present time it is probable that there are several thousand Chinese who make a living by photography. The requirements of their customers are by no means difficult to satisfy, only the peculiar views of the Chinese as to lighting and perspective must be studied.

In a portrait the face must be as white as possible; indeed, it is usual to place the sitter in direct sunshine. All shading in the face must be removed by retouching, white lead being used for painting on the positive pictures; so that eyes, mouth, and nose are merely black dots or strokes. It is scarcely necessary to say that all resemblance to the original is lost.

Landscape photography scarcely exists in China, but the Chinese photographer is continually seeking what he can never find—an objective which will produce pictures correctly, according to the native view. He would only be contented with an instrument capable of reproducing the first house and the last house of a street view equally large. For this reason, the Chinese ordinarily take only such photographs as include but a single building.

In Japan, the conditions under which commercial photography has developed itself are somewhat different, nine-tenths of the Japanese photographers having been, at one time or another, assistants to Baron Stillfried. As soon as one of these assistants imagined himself to have learned enough to work independently, he ordinarily left, and established himself on his own account. When, however, these newly-established photographers found that they could not make good pictures, they concluded that there was some mystery in regard to the preparations used, and in several cases it has happened that when a European photographer has been working in the streets, large sums have been offered for his working appliances taken as a whole.

In conclusion, we may say a few words about the pictures which Baron Stillfried has on exhibition at the Stubering Museum. The collection is by no means confined to photographs, as there are water-colour and outline drawings, also a few miscellaneous objects. The active traveller Stillfried is, indeed, no conventional artist, but he deals clearly with things as he finds them, and his collection is thoroughly illustrative of the countries and the people, while the sacred and profane buildings or monuments are abundantly represented.

As far as the Chinese collection is concerned, we are more especially interested in a panorama of Hong-Kong. In Siam we are introduced to the governors in their state robes. We halt in the summer residence, and in the harem; while we can trace the influence of European architecture in the style of a Gothic church, and in the hotels. We also see the sacred gala-elephants, and find much to admire in the country round Bankok. Perhaps, on the whole, the Japanese scenes are the most interesting of all. Magnificent gardens, avenues of cedars, charming many-branched waterfalls, glaciers, pagodas with rich wood-carvings, quaint old symbolical doors, and sacred groves being among the striking features of the scenery.

Character studies abound, and among the female singers, dancers, and the tea-house waitresses, one finds many notable types of face; while pugilists, gladiators, and beggars all afford subjects calculated to interest the physiognomist.

STRIPPING THE FILM FROM GELATINE NEGATIVES.

WE have frequent enquiries as to the best means of removing a gelatino-bromide negative from its glass support so that it can be used either as a direct or reversed negative, and it does not appear to be very generally known that about two years ago Mr. Plener described a method which answers well under all circumstances, whether a substratum has been used or not.

If a negative is immersed in extremely dilute hydrofluoric acid contained in an ebonite dish, say half a teaspoonful to half a pint of water, the film very soon becomes loosened, and floats off the glass, this circumstance being due to the solvent action which the acid exercises upon the surface of the plate as soon as it has penetrated the film. If the floating film be now caught upon a plate which has been slightly waxed, and it is allowed to dry on this plate, it will become quite flat and free from wrinkles. To wax the plate, it should be held before the fire until it

is moderately hot, after which it is rubbed over with a lump of wax, and the excess is polished off with a piece of flannel. When the film is dry, it will leave the waxed glass immediately, if one corner is lifted by means of a penknife. The film will become somewhat enlarged during the above-described operation; but, by taking suitable precautions, this enlargement may be avoided. It is also convenient to prepare the hydrofluoric acid extemporaneously by the action of sulphuric acid on fluoride of sodium; and, in many cases, it is advisable to thicken up the film by an additional layer of gelatine.

The following directions embody these points. The negative, which must be unvarnished, is levelled, and covered with a layer of warm gelatine solution (one in eight) about as thick as a sixpence. This done, and the gelatine set, the plate is immersed in alcohol for a few minutes in order to remove the greater part of the water from the gelatinous stratum. The next step is to allow the plate to remain for five or six minutes in a cold mixture of one part of sulphuric acid with twelve parts of water, and in the meantime two parts of sodium fluoride are dissolved in one hundred parts of water, an ebonite tray being used. A volume of the dilute sulphuric acid equal to about one-fourth of the fluoride solution is next added from the first dish, and the plate is then transferred to the second dish, when the film soon becomes liberated. When this is the case it is placed once more in the dilute sulphuric acid. After a few seconds it is rinsed in water, and laid on a sheet of waxed glass, complete contact being established by means of a squeegee, and the edges are clamped down by means of strips of wood held in position by American clips or string. All excess of sulphuric acid may now be removed by soaking the plate in methylated alcohol, after which it is dried. It is as well to add a few drops of ammonia to the last quantity of alcohol used.

The plate bearing the film negative is now placed in a warm locality, under which circumstances a few hours will suffice for the complete drying of the pellicular negative, after which it may be detached with the greatest ease by lifting the edges with the point of a penknife.

TABLE OF APERTURES OF LENSES.

THE Table which we append is intended for the use of those who, not caring to have a new set of stops cut for a lens, are nevertheless desirous of knowing to what numbers of the Great Britain Society's standard the existing stops of a lens correspond.

Most of our readers are aware that the Photographic Society of Great Britain took as a unit a lens whose diameter of aperture is $\frac{1}{4}$ its focal length, or, as it is usually said, which works at f_4. A stop of half the area of this

Ins. Diam.	$\frac{1}{10}$	$\frac{3}{32}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	4_2	5
3 ins.	144	64	36	16	9	4	2·25	1·44	1	·562	·36	·25									
$3\frac{1}{2}$	196	87·1	49	21·8	12·2	5·45	3·06	1·96	1·36	·766	·49	·34	25								
4	256	114	64	28·4	16	7·11	4	2·56	1·78	1	·64	·444	·326	·25							
$4\frac{1}{2}$		146	81	36·5	20·2	9·12	5·06	3·24	2·28	1·26	·81	·57	·413	·316	·25						
5		178	100	44·4	25	11·1	6·25	4	2·78	1·56	1	·694	·51	·39	·309	·25					
6		256	144	64	36	16	9	5·76	4	2·25	1·44	1	·738	·562	·444	·36	·25				
7			196	87·1	49	21·8	12·2	7·84	5·4	3·06	1·96	1·36	1	765	·605	·49	·34	·25			
8			256	114	64	28·4	16	10·2	7·11	4	2·56	1·78	1·3	1	·790	·64	·444	·326			
9				146	81	36·5	20·2	13	9·12	5·06	3·24	2·28	1·65	1·24	1	·81	·57	·413			
10				178	100	44·4	25	16	11·1	6·25	4	2·78	2·04	1·56	1·23	1	·694	·510			
11				215	121	53·8	30·2	19·4	13·4	7·56	4·84	3·38	2·47	1·89	1·49	1·21	·845	·617			
12				256	144	64	36	23	16	9	5·76	4	2·95	2·25	1·78	1·44	1	·738	·562		
13					169	75·1	42·2	27	18·8	10·6	6·76	4·69	3·45	2·64	2·09	1·69	1·17	·862	·66	·521	
14					196	87·1	49	31·4	21·7	12·2	7·84	5·4	4	3·06	2·42	1·96	1·36	1	·765	·605	
15					225	130	56·2	36	25	14	9	6·25	4·59	3·51	2·78	2·25	1·51	1·15	·878	·694	
16					256	114	64	41	28·4	16	10·2	7·11	5·21	4	3·16	2·56	1·78	1·3	1	·79	
18						146	81	51·8	36·5	2·2	13	9·12	6·61	5 06	4	3·24	2·28	1·65	1·24	1	·81
20						178	100	64	44·4	25	16	11·1	8·16	6·25	4·94	4	2·78	2·04	1·56	1 23	1

was to be called "2"; one of $\frac{1}{3}$, "3"; of $\frac{1}{4}$, "4"; and so on. It was, at the same time, determined that the standard stops should be those to which the figures "1," "2," "4," "8," "16," &c., would attach each stop, thus necessitating double the exposure which was required by the one before it. The figure attached to a stop would thus always indicate how many times longer an exposure would be required with that stop than with a lens working at f_4.

It is not to be expected that in a lens with stops cut before the Society's standards were published, the diameters will be so adjusted as to correspond with the numbers "1," "2," "4," "8," &c., and it cannot be expected that such a set of stops will be as convenient in use as those which are cut to correspond with these figures. Nevertheless, the facility with which they may be used will be much increased if they be stamped with figures which indicate their relation to the standard unit, and as a consequence their relations to one another. The object of the Table is to facilitate such stamping.

We shall take an example of the working of the Table, and, to make the example as practical as may be, we have taken up one of our own lenses, and have measured the stops. The lens is a portrait one of 14-inch equivalent focus; the full aperture is 3 inches; the diameters of the stops respectively $2\frac{1}{4}$ inches, $1\frac{3}{4}$ inches, 1 inch, $\frac{5}{8}$ inch and $\frac{3}{8}$ inch.

We refer to the Table, and find opposite 14 inches in the first column, and under 3 inches in the top line, "1·36." This gives the ratio which the area of the lens full aperture bears to the area of a circle whose diameter is $\frac{1}{4}$ of 14 inches, or $3\frac{1}{2}$ inches. Under $2\frac{1}{4}$ inches we find "2·42"; under $1\frac{3}{4}$ inches, "4"; under 1 inch, "12·2"; under $\frac{5}{8}$ inch, "31·4;" under $\frac{3}{8}$ inch, "87·1."

These figures stamped on the diaphragms give us the relative exposures required with the different stops.

RAPID DIRECT PRINTING FROM THE WOODBURYTYPE RELIEF.

OUR readers are familiar with Ives' method of making a transfer or "mother print," by inking the Woodbury relief and taking an impression on paper which has been indented or grained, so as to leave pyramidal projections (vol. xxvii., page 498), and we have recently made an extension of the method, by which direct prints can be obtained from the Woodbury relief at the rate of over a thousand an hour on the ordinary machine. A Woodbury relief which had

been developed upon a thick slab of plate-glass was mounted like a surface block by the side of some type matter on the bed of a printing machine, and the machine was fed with paper which had been grained by pressure, just like ordinary book-binder's cloth. Under these circumstances prints were produced with a perfect gradation of half-tone, from the more or less complete crushing down of the pyramidal projections upon the paper by the inked relief; while the impression from the type itself was clear and sharp. It may be mentioned that, as an article of commerce, the grained paper should only cost a trifle more than plain paper, and it is possible to see important commercial applications of the method just described. Among these we may mention its applications to the decoration of book covers (leather or cloth), linen, calico, or even wood, it being merely necessary to impress a suitable indented grain in the first place.

A few words may also be said as to similar applications of the so-called Crayontype method, described by Mr. Ad. Eggis in our last volume (p. 789). If a few copies are required, the Woodburytype relief should be mounted on the bed of a press or machine, and each sheet of grained paper as fed in, should be faced over with a sheet of the so-called manifold tissue or carbon paper. Either the commercial crayon paper referred to by Mr. Eggis may be used, or such pyramidal paper as is referred to above; while excellent results can be obtained on grained leather, textile fabrics, or wood. It is scarcely needful to say that it is unnecessary to specially purchase the carbon paper, as any thin paper or fabric slightly inked with printer's ink will answer well; very thin silk being especially suitable. When the image is to be transferred to stone or zinc for etching, it is well to use a special transfer ink.

A form of card printing machine exists, in which a band of silk that passes between the type and the paper carries the ink supply; the impression being in reality a set-off from the inked band. By mounting a Woodburytype relief in such a machine, and printing on grained cards, photo-mechanical prints might be produced with a surprising degree of rapidity, and type matter could be printed side by side with the photograph—a business card, we will suppose, with a photographic view of the premises, or a visiting card with a portrait.

A TRIP TO THE GREAT SAHARA WITH A CAMERA.

BY A COCKNEY.*

THERE is a pleasant walk to the west of Philippeville on a green hill slope that reminds you of the North Walk at Lynton, except that there is here more foliage, also an abundance of cacti, aloes, and orange trees. After four o'clock the temperature is delightful; but the sun is hot and glaring enough about noon. On the other side of the town, again, there is an excursion worth taking to the villa of a M. Landon, whose gardens are redolent with the odours of heliotrope, hedged, in some cases, with blooming geraniums three or four feet high. The low, white villa itself is not remarkable, except for the fact that on one side thereof is a huge wooden kennel, in which repose a lion and lioness. His majesty is still a tawny youth of three years, with magnificent mane and tail; he is behind bars, of course, but the side wall of the house abuts his domain, and he can put his nose in at the scullery window, and so worry the cook, when he chooses. Let grumbling serving-maids at home think of this; they can, at any rate, peep out of their area windows without meeting with anything more formidable than a policeman.

There is a railway to Constantine; but four hours are necessary to get over the sixty miles. Constantine was the last stronghold to stand against the French, and without cannon its position is simply impregnable. Only on one side can you enter the town without a bridge, and this but by a narrow causeway. Otherwise, Constantine is perfectly isolated, perched on a lofty rock, separated by a yawning abyss from the rest of the world. In some places the rocky walls of the town rise to the giddy height of one thousand feet; and where the principal bridge spans the ravine, there the ugly cleft below, in which the rapid Rummel makes its way, is five or six hundred feet down, a far more striking picture than the far-famed Via Mala at its worst. The Eagle's Nest is the Frenchman's name for this city, and most appropriate is it for Constantine.

In the narrow streets of Constantine you are cheek by jowl with the Arabs. They sit at every doorway, stand at every corner, squat on the grass matting of every room you look into. The snow-white blanket or bournous, in which nine out of ten envelop themselves, gives the impression that you are in a city of ghosts—that is, when you have once got out of the notion that everybody has just taken a bath, and is wrapped in his white *peignoir*. In the principal streets there are still plenty of Europeans; but once penetrate into the body of the town, and the small shops and bazaars are crowded with "blankets"; while the narrow, tortuous alleys—not unlike the old part of Geneva, but much sweeter—are as thickly populated as an ant-hill.

My first plate has yet to be exposed. From the balcony of the hotel we can see the market, in front of which are gathered blanketed Arabs by the score, of every shade of colour, from the light olive of the north, to the jet black Nubian. I suggest to my friend Jones—I will call him Jones for short—we shall screw on the camera-stand and take a view then and there. He is quite agreeable. "We can then," I added, "go into the Arab quarter afterwards." Jones gives his unqualified assent. "We shall have plenty of time to do the native bazaars when we like," I say airily. "Of course we shall," says he.

The fact is, we are a couple of cowards. We would rather take a picture under shelter of the hotel, than trust ourselves among the natives. Fortunately we grow ashamed of ourselves before the picture is taken. "Come on out now; what do you say?" is presently put forward, rashly, and before we can repeat our valiant resolution, we are off down the street armed with the camera and dark slides.

C'est le premier pas qui coûte, and when we have taken our first step into one of the side streets, the task is more than half finished. The lassitude, do-nothing character of the solemn Arabs in their winding-sheets is quickened for a moment at the sight of the camera, and the white teeth of the darkies grin with pleasure. By the way, your tame Arab never seems to smile; you may look at him for half-an-hour, and he will not betray the least surprise; he is bereft of all curiosity, and does not move for minutes together. "What magnificent models for the camera!" my readers will say; for myself, I only hope that some of my clumsy efforts to secure a group of them may be successful.

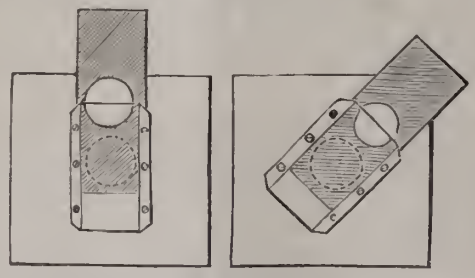
Here is a native coffee house, a "café Maure," as it is called, for Moorish seems a term adopted by Arabs who are settled in a town. Two or three "blankets" are squatting at the door, to give a *pièce de résistance* for the picture, and I hope to drop my shutter in time to get a few passers-by. I do get passers-by, but not a few. They come in troops. A friendly Arab shouts in French, a turbanned Turk roars in Turkish, a donkey-boy cries out in Arabic, and I holloa in English. The scene grows lively, but, thank goodness! everybody is delighted. A stalwart negro in blue breeches and gold-lace embroidery comes up chuckling, so I take him by the shoulders and push him beside the café door. Sambo enjoys the joke immensely, but won't stand. So the shutter has to fall on what it can. A second plate is pushed in; the crowd is beginning to enjoy my entertainment immensely, but they won't keep back. They think my juggling with the camera capital fun, and take it for a peep-show, evidently; they surround me closely. Again do I sally forth, and make a lane for

* Continued from page 115.

the lens, and a second time I let my shutter drop because I must; it is a case of a crowd or nothing.

Next, for a view of Constantine itself, perched upon the top of the cliff. I shoulder the camera, raise my hat, and move off. The crowd, fortunately, do not follow, but fall back at once to their former state of quiescence to discuss me and my apparatus at leisure. What splendid models pass on my way down! Here is a white-bournoused Saracen, mounted upon a beautiful Arab horse, with a skin of white satin and full flowing tail. Look at the man's erect carriage, clothed in white from head to foot—at his handsome trappings—at his gold-stitched harness, his chair-like saddle, and quaint shoe-like stirrups. It reminds you of the pictures of the Crusaders, and awakens in the Cockney mind those wonderful pictures of Skelt, published, I think, in Fetter Lane, a penny plain and twopence coloured. Or look at this tall young aristocrat of an Arab with cachemire toga, yellow leather stockings, and embroidered slippers, a veritable Masher Mahomedan. But they disdain even to look at me or my camera; they betray not the least knowledge of your presence, and do not give a glance in your direction.

I choose a small stop for my architectural picture, and use the cap instead of the shutter, for I mean to give an exposure of two or three seconds this time. By the way, the shutter I use is a neat little drop diaphragm of Hunter and Sands, made of ebonite, to which I have affixed in front a projecting wire for hood or shade. I have chosen it not only for its simplicity, but because, with a little care, its action may be varied considerably. A suitable weight (I employ a bunch of keys) put astride the diaphragm makes it fall very rapidly for quick exposures, while if you want to retard the fall, a plan which has several times been mentioned in these columns may be adopted on the spur of the moment. This is simply to twist the shutter apparatus round, so that instead of the diaphragm falling perpendicularly, it glides slowly down in a slanting position, say at an angle of 45°. Thus—



I do not know any other shutter at once so simple and effective for the tourist photographer.

I find my friend Jones's umbrella exceedingly useful just now to help in shading the camera, for the light is exceedingly fierce and bright, at any rate, to one who but a week ago groped about in a London fog. Two views of Constantine from the bridge are soon taken, and then there remain two other films to expose, to exhaust my slides. There is an encampment of camels outside the town, but as I expect to meet plenty of these among the palm trees of the oasis, I pass them over, and turn my steps to the Place Negrier, where there are some attractive native shops close by the Mosque. Sharp is the word, if you want to expose before a crowd gathers; and this time, with a little more experience of native character to guide me, I do pretty well. Two shopmen seated on their shopboard, talking to a lounging customer, also seated—for no one thinks of buying and selling without sitting down—are my chosen models, and within five minutes I retire with impressions of them upon a pair of plates.

Now I get used to it, I find photography a capital introduction to the good folk. Their solemnity vanishes, they grow animated, and those who know a few scraps of French chat and joke most affably. Nay, the austere turbanned Mahommedan, whom you half feared might throttle you with your own dark cloth, sympathises with you heartily, keeps the crowd from pressing against the camera-stand, and bids the gamins stand still. In fact, they are too good. If I were now asked the shortest way to make friends with them off-hand, I should say, take a camera with you and photograph away in their midst.

The second day's work is not less pleasant than the first. There is a palace here, but it is modern, and of fifth-rate order, so I do not throw a plate away upon it. I content myself again with the Arab quarter, trying a picture here and there in the slums. The Arab women, as my readers know well enough, are rarely seen out-of-doors, and when they do come out, they have their faces covered with a white visor-like mask, that has a small slit to see through. I tried once or twice to catch an Arab damsel, but cannot say yet whether I succeeded.

The Jewish quarter of Constantine is quite as picturesque as the Arab quarter. The jewesses—who commingle freely with the Arabs—adopt a custom the reverse of their Arab sisters. They are dressed out in the most gorgeous of coloured raiment, they wear bracelets, rings, and gewgaws in profusion, and their arms and necks, as well as their faces, are bare. They all incline to embonpoint, and, strange to say, while you rarely see an Arab woman in the street, so you scarcely see a Jew. I presume these latter all dress in blankets, and are, therefore, not to be distinguished from Arabs.

M. Chazal, who has a studio at Constantine, and to whom M. Leon Vidal was good enough to give me a note of introduction, permitted me the run of his premises, and allowed me to change my plates in his dark-room. This was a great convenience, and I beg to thank him here for his kindness. He was delighted to hear of my intention of going into the Sahara. "You are quite safe as far as Biskra, and may go on to Turgurth, if you like, three days further." Beyond that, it seems, travelling is rather dangerous, because you always get killed. Jones and I will, therefore, be content to visit the Biskra oasis, which, so far as I can learn, is the second or third from the north.

M. Chazal was delighted with my little camera, and praised English camera-makers to the skies; he had also a good word to say for the plates of English makers, but he pronounced them all *fort chers*. I will not translate, for fear of offending the delicate susceptibilities of my countrymen.

There are two or three things that I cannot quite make out in this photographic tour of mine. For instance, why is it that, after I have taken a couple of pictures of some native bazaar, I always come immediately afterwards upon another bazaar scene that is ten times better? Why, when I have pitched upon a good subject, it seems to lose most of its picturesque character by the time I have focussed it? Why, when I am patiently waiting to expose, there should come into the picture not an Ali Baba with his donkey, but a town-dressed Frenchwoman, with her conventional frill-capped daughter?

The reflector lantern friend Jones and I are carrying into the Desert is all right up till now. It has borne the thirteen hundred miles of travel well, and there remain but two hundred more for its journey into the interior. And for the interior we now start, after a pleasant sojourn of four days at Constantine.

I will say two words about this start ere I close. Jones and I both feel we are in for it now: but we are getting so used to blankets and their wearers, that, bless you! we wouldn't mind hustling a small one—that is, in the daytime, and if he were alone. We even walk out of an evening without being the least afraid, and go among groups of the silent, white figures, quite boldly, although they look very much like the domestic ghost or common bogey of childhood.

But the start for the interior. Well, truth to tell, it is

not very serious, after all. We buy tickets at the railway station for Batna, and get into a carriage uncommonly like one on the North London line that takes you to Broad Street. In fact, the French threaten a railway not only to the confines of the Sahara, but three hundred miles into the Desert, so that ere long there will be a dining-room car to Timbuctoo, just as there is one now-a-days to the Riviera and to Rome.

By-the-Bye.

ART AND CONCEIT.

IT has always struck us as a curious fact that in the long controversy touching photography and fine art, and the question whether or no the photographer is an artist, no one seems to have thought of applying the simplest touch-stone of all. By-issues of every kind have been raised, while the basis of all argument is ignored. Like a chemist who commits the fault of beating about the bush to tell what sort of metal there is in a body, when no metal at all exists, so the discussion seems to have missed the proper starting point. We do not mean to say that the whole question could be satisfactorily solved out-of-hand by a single question and answer, but, at any rate, photographers would thereby establish a *prima facie* case. One simple mode of reasoning would be to ask, of such or such a man—is he conceited? If he is, then, *prima facie*, he is an artist.

There are, no doubt, exceptions to this rule, as to every other, but they are very few. Again, one class of artists is more conceited than another, which is a very different thing to saying that some are less conceited than others. The actor, the painter, the poet, the sculptor, the musician, the novelist—all are endowed with conceit, and from the fact that we have met many photographers out of conceit with their works, we assert that they have gone a good way to be considered artists, although it might be too much to say that the converse is always true, and that every conceited man or woman is an artist.

And now having said so much, we will go further and say that conceit is inherent to art. Nor is there any great harm in being conceited, if only you are true to yourself and acknowledge the fact. Charles Dickens once naively admitted in a preface—we think that of Dombey and Son—that however kind his kindly critics were, and however meritorious they thought his book, none of them entertained such a high opinion of it as he himself. And so we say, that as long as you will but acknowledge your conceit, if it is only to yourself, all may be well, for you carry within you the antidote as well as the poison. How difficult it is to do this, only the successful man knows. His works are so loudly commended, his talent so highly vaunted, his praises so widely sung, that if he be young and inexperienced, no wonder he loses his wits, and half fancies himself the demi-god the critics make him out.

Conceit in artists is due to the fact that they or their works come face to face with the public, and for this reason it is that the actor has usually more of this virtue or vice, whichever he chooses to call it, in his composition. Being but a human being with his weaknesses like the rest of us, but subject more than other people to the insidious influence of loud praise, he feels the result more. Praise and flattery to tragedian or comedian are the breath of his nostrils, the sole indication of his success or failure; can it be wondered, then, that he will sacrifice most all to obtain them, and that the encomiums repeated again and again should heighten the estimate he forms of himself? So gross may his conceit become in these circumstances, that it loses all power of discrimination, and so long as praise comes, and comes in quantity, there is no question as to its quality. After a while, if successful, he is no longer satisfied with a modicum of soft-soap and frothy lather; it must needs be mixed in a bucket and poured over his head and down his back, to approach in quantity what he feels to be his due.

Scarcely less conceited are other artists, albeit the *litterateur* now and then has the advantage of receiving a lesson which, if taken to heart, occasionally, though rarely, raises the doubt in his mind whether he is so much better than his fellows. The literary man, you see, is of the same trade as his critics, and his mind is now and again balanced by brethren in the craft, who form another estimate of his worth, and tell him what that estimate is in print. In the case of other artists, there is no such wholesome corrective, for they are not their own critics. When a good criticism appears, it is acknowledged as only due; when it is a bad one, it receives no attention, since it has obviously been written by one who knows nothing of the subject he discusses.

But are photographers conceited about their work? Since they are younger brethren in the world of art, do they not relegate themselves to a humble position? We fear not. Some years since there was an animated discussion upon the subject of over-praising pictures at the Annual Exhibitions. Some half dozen gentlemen spoke very warmly on the matter; they were of opinion that it would be more conducive to art in photography if the criticisms on their pictures were more strict and severe. In a word, they would like to see the pictures at the exhibitions criticised sharply. "Tell us our faults," they said frankly, after the style of the Archbishop in Gil Blas, "and we shall be only too pleased." And yet of these gentlemen, we remember, there was one who has not exhibited since that day, and another has labelled his pictures that they were not for competition. In a word, these anxious ones desired sharp criticism—for others. Their position was so well assured, they have been praised so often and so highly, that criticism could not affect them. Yet, take them at their word and try them. Act, as did Gil Blas to his patron the Archbishop; hint to them, as gently and as lightly as you can, after the example of the Spanish hero, and see if the result is not precisely what he found it to be. The man who is so high up, who has monopolised all the praise, who has received the utmost adulation, whose position is assured, is just the one of all others who resents the least word of doubt as to the perfection of his picture. In fact, he is so accustomed to praise that he shows you picture after picture, study after study, with inviting glances and sententious grunts. He simply does so to ensure a stream of grateful homage from your lips; nothing else is possible. That is your rôle. Your friend plies you more and more; you are so sensible and so 'cute in your judgment, he implores you, if you see a fault, to mention it. And so at last you fall into the trap.

You are delighted, enraptured, in ecstacy; and then, having thus far shown your high appreciation, you think he may be tempted to accept one little word of doubting criticism. The spell is broken. He is off at once; the pictures are collected with a hasty hand, the portfolio is closed, and shortly afterwards he may be heard whispering what a fool Brown is, he having actually hinted that the foreground—that fine foreground of brake and bramble in my cottage picture, don't you know—was too striking, and interfered with the principal idea of the picture.

But surely there are plenty of photographs exhibited year by year which are quite open to criticism, and for which nobody would claim perfection! Undoubtedly, although here sometimes the proviso must be made—nobody but the author of them. At the same time, the authors of humble efforts are generally those that need criticism the least, for they are well aware of their shortcomings, and make no profession to be perfect. With them, therefore, we have nothing to do, for they do not come within this rambling dissertation. Our object, if we had any, was to simply point out, that since art and conceit go hand in

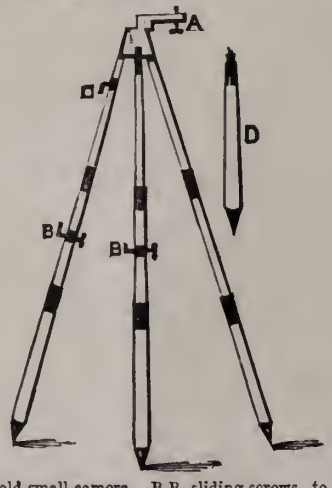
hand, it seemed to us, photographers had as good a claim as any of their prouder brethren to be considered artists. Still, the reader of these lines must not forget the old saving clause about, "present company always excepted," and bear in mind that we had no idea of instancing him particularly in introducing our theme; he is one of the exceptions that prove the rule.

COMBINED EASEL AND CAMERA-STAND.

BY T. G. WHAITE.

THIS stand is designed specially for the use of artists, and intended only for the small cameras employed by them. It is made of bamboo, and each leg being in three pieces, the two upper ones sliding, when packed, within the lower one. By placing the thicker end of the leg on the ground, very great strength and rigidity are obtained.

It is a fact that every stand hitherto made with the thicker end at the top, approaching the camera, shakes more or less with a moderate breeze.



A, bracket to hold small camera. B B, sliding screws, to receive canvas or sketch-block. C, hook, to secure canvas. D, leg as packed for travelling.

The stands I use are all made of bamboo, and the thick end on the ground. Since I have adopted this plan, I have never lost a picture by vibration of stand.

The upper portion of the leg drops within the centre one, to enable the artist to take his photograph from his "camp-stool" point of view, if desired.

PHOTOGRAPHIC RESIDUES, AND THE RECOVERY OF THE VALUABLE METAL THEREFROM.

BY F. W. HART, F.C.S.*

SENSITIVE PAPER CUTTINGS.

THE best receptacle for these is a basket; if any are put in wet or damp, they will dry. Let this not be a place to throw in all kinds of rubbish, as every pound weight of such will cost you at least half-a-crown in firing, flux, and time. It is not at all unusual to discover in the ashes sent to the smelter, burnt nails and screws, portions of scissors, parts of brass hinges, zinc, and lead. Of course this more than useless rubbish makes up a weighty parcel, but rest assured that you cannot have that separated from the silver except at a considerable cost; having collected a batch of silver paper, it is better to reduce them to ashes periodically in case of accident from fire when stored in large quantities. One pound weight of dry cuttings yields about one ounce of ashes of a light drab colour. If burnt in thick compressed portions, or with insufficient air for combustion, the ash will be more or less black; the blacker it is the more flux will have to be used, consequently, larger pots, more fuel, and expenditure of time. For small parcels of cuttings an old iron tray (or sheet of iron) may be used; place a row of bricks round on edge, lay some iron rods across to make an *extempore* grating. Select a place to burn without strong currents of air—under a wide open chimney is best, or in open air on a calm day; lay the cuttings lightly on the iron rods, and continue to supply gradually; collect the ashes to one side occasionally as they cease to show any ignited portion, then press them down tightly. I will now suppose that one pound in weight has been obtained; mix with that quantity six ounces nitrate of potash or soda, eight ounces dry carbonate of soda, and six ounces dry carbonate of potash. Grind the whole together in a mortar, which will greatly reduce the bulk of the mixture, and if it is a sample of ash free from rubbish, the proportions will give a fluid flux with a moderate yellow heat. If useless waste paper, cards, kaolin, &c., have been burnt with the cuttings proper, it may take double that amount of flux to produce a sufficiently fluid state to allow the fine particles of silver to subside; hence the necessity of keeping your residues as clean as possible. Having consolidated your mixture of ash and flux, pass it through a fine sieve. Portions of pins, nails, &c., however few, should be thrown on one side, for, bear in mind, the value of the metal recovered will be according to its freedom from alloy. The crucible prepared as before, and of a dull red heat, is now filled up to within an inch of the top; keep the fire about the same red heat until you have got in the full charge. The mixture commences to scintillate quietly, the oxygen of the nitrate combining with the carbon and traces of common metal escaping the sieve. When this sparkling has discontinued, press the now doughy mass down with the stirrer, and fill up the crucible again, not allowing the temperature of the fire to rise. Repeat the operation for the third time. The crucible contents, after the third pressing down, may be about half full; raise the heat gradually, occasionally stirring the contents of the crucible, and be very careful as it liquefies that no fuel falls into the molten flux, or it will most likely boil over. Always have an inch iron cold bar at hand to plunge into the flux, to reduce the temperature, in case of a sudden boil up; the heat is to be kept up till the contents of the pot settles down to quiet fusion, and until a sample of the flux brought out on the stirrer shows no sign of beads as large as a small pin's head. Then shut on the cover of the furnace, and get up the heat to full yellow for ten to fifteen minutes, when it will be ready to pour as before directed.

HYPO FIXINGS.

Precipitating Method.—Use a jar, as described for washings of prints and other nitrate solutions. Prepare a stock of concentrated solution of crude potassium sulphide (liver of sulphur) in a stoppered Winchester. Have a small cup of about an ounce capacity, and add one measure to (say) 3 gallons of fixing solution, stir up the solution vigorously, and the precipitate will most likely have a medium brown colour. Let it subside a few hours; then take a dip of the clear solution in the cup, and dipping a glass rod into the concentrated sulphide, let one drop fall into the cup; if a thick, dense brown precipitate falls, add another measure of sulphide to the bulk; stir again, and allow to subside. If, on again testing the clear solution, you only obtain a clear brown stain, the metal is all but thrown down; add only a drachm of sulphide, and test again after an interval for clearing; the precipitate will now exhibit a brownish-black colour, and the clear solution will be limpid like water; if yellow, it would be a proof of excess of sulphide, which is to be avoided—gold being partially soluble in such a solution. Having proceeded in this way, there will be no unpleasant smell; and if the fixing is conducted on the system I have indicated elsewhere, the quantity of sulphide can be put in at once, and only one testing needed.

The clear solution is decanted or syphoned off as in the case of the chloride, when sufficient precipitate is collected at the bottom, to make it advisable to clear out on to a shallow pan, after the washing away of soluble salts. The precipitate is then dried off in an oven, or on the top of the furnace at a strong heat, and preserved to a convenient time for reducing. There are other processes, but they are far inferior. One is to keep scraps of zinc in the fixing solution vessels; the metal is a long time going down, and is complicated with zinc. The fixing solution containing silver can also be reduced to the metallic state by electro-chemical action, but after so many years' experience, none of the many methods proposed from time to time give so little trouble, nor do they work so perfectly, as the sulphide precipitation. When properly carried out as indicated above, there is no annoyance whatever from unpleasant smells. If any sulphur have been deposited from the addition of acid to the hypo,

* Continued from page 117.

or long exposure to the air, the sulphide of silver will have in admixture free sulphur. It will then be advisable to expose such mixture on a roasting dish—a shallow fire-clay saucer—at a low red heat, the furnace top off, so that the air has access. The free sulphur will then burn off with its characteristic blue flame. Now take (say) one pound of the roasted sulphide of silver; add about seven ounces nitrate of soda, four ounces dried borax, six ounces dry carbonate of potash, and half-ounce of fine sand. Mix in the mortar, and pass through the sieve once or twice; put it into a bowl, and place near the furnace so as to be conveuient to ladle into a red hot crucible, small portion at a time, allowing deflagration to subside before adding further portions. Finally, raise the heat gradually to the yellow stage, stirring occasionally, and when calm fusion has set in, cover the furuace aud keep up a strong heat for fifteen to twenty minutes; make examination of the flux for beads, and if free from such, and the flux on breaking exhibits a glassy fracture, the contents may be poured into the ingot mould. This metal (if from gold-toned prints) contains gold, and should therefore be kept separate for parting assay, otherwise it is best to combine the separate ingots from the pot into one bar for single silver assay.

Spent Gold Toning Baths.

Collect these in conical glass vessels—precipitating jars; such vessels are obtainable holding about nine pints, or as small as assay flasks of one or two ounces. First acidify the solution with sulphuric acid, then add about half-an-ounce of hydrochloric acid to the gallon. Next prepare a saturated solution of sulphate of irou, add gradually, stirriug with a light smooth rod of wood until no further cloudiness is observed on looking through the glass. Allow the solutiou to stand at least twenty-four hours, then add a drop or two of iron solution to the now bright solution, and note if it produces any cloudiness; if so, add more sulphate of iron solution, stir up, and allow to subside again; as the precipitate is very valuable, it may stand for two or three days to collect the finer particles from this high gravity solution. When so subsided, decant very carefully, and then fill up the vessel with water rendered acid with sulphuric acid; a few hours will now be sufficient for subsidence. Decant again, and repeat three or four times, reducing the quantity of acid each time, the last being plain water. Collect the precipitate in a porcelain dish or crucible; dry off in an oven: the result is a mixture of metalic gold and chloride of silver. Melt in a small smooth crucible, called assay gold pots, with a portion of the flux recommended for the reduction of chloride in process B. Do not neglect to first glaze the pot with borax, leave the button of metal in the pot till cold, then break off the button to obtain it, clean, and weigh. Now take three times its weight of metallic silver from your other reduction, and melt together in a plumbago pot, and pour the melted metal, as soon as liquid, into a pail of water; collect the granulated metal; wash with distilled water. Then dissolve in dilute nitric acid by the aid of heat; the gold will be left as a rich brown powder, which has to be washed after decanting the acid nitrate of silver solution; then boiled with a fresh portion of nitric acid, and again well washed, testing the washiug to see if any silver is contained therein. Finally, dry for sale or use.

Gelatine Emulsion Residues.

I have used two methods for extracting the silver from gelatine solutions. In working on batches of six to ten gallons contained in chemical stoneware pans, the solution is made strongly acid with hydrochloric acid, and zinc plates placed therein. I now pass into the mixture steam at about twenty pounds' pressure to boil up rapidly, and continue the boiling for at least twenty minutes; the bromide of silver is thereby converted into metallic silver, which is allowed to subside. For small quantities I warm up the solution, dilute considerably with hot water, and add some hydrate of soda solution, then hyposulphite of soda to dissolve the bromide, and so obtain a clear solution. The silver is now precipitated with sulphide of potassium, and collected as directed under "Hypo Fixings" above described.

FRENCH CORRESPONDENCE.

Balagny Pellicle Paper—Vidal's Pocket Apparatus—Double Dark Slides—New Product for Photographic Accessories—M. Liebert on Photography in America.

Balagny Pellicle Paper.—Having previously written about M. Thiébaut's reversible pellicle paper, I have now to announce a new product of the same kind, but even better in its results. It is M. Balagny's reversible pellicle paper. As it has been patented, we do not wish to penetrate the secret of its manufacture, the most important point being that it is excellent, and does honour to the inventor, who has been two years diligently working, in order to bring it up to its present state of perfection. In describing it, the good quality of the emulsion is first observable: being developed in the ordinary way with either ferrous oxalate or pyro, it gives negatives of great intensity, and the development may be carried on at will in cases of over- or under-exposed pictures. The paper is treated exactly as an ordinary plate, without one having the least cause to fear frilling, detachment from the sensitive film, or rolliug up during the processes of fixing, washiug, &c. The paper keeping flat renders it easier of manipulation than a glass plate. Directly the image is fully developed, it is washed, dipped in a five per cent. alum bath, and in twelve per cent. of hypo in solution. It is again washed, and treated according to the different ways it is desirable to preserve the pellicle:—1. It may be a negative on glass; or—2. Reversed on the glass. 3. On a gelatine film in the state of a pellicle. 4. On gelatine between two coats of normal collodion. 5. It may be transparent (in the whites of the negative) like a glass negative. I do not say that other similar papers do not realize some of these *desiderata*, but, to my mind, none do so completely and practically. After the last washing, which may be accomplished without fear of detachment, the negative is taken out of the water, and the right side of the image pressed against a glass plate dusted over with French chalk, then coated with 1·5 per cent. normal collodion, and this again covered with a film of gelatine about $\frac{1}{3}$ of a millimetre in thickness. One can always have a certain number of the plates ready for use. The plate, with the pellicle paper upon it, is dried first between blotting-paper, and, when perfectly dry, the paper may be pulled off, and the pellicle coated with the same normal collodion. As soon as the whole is dry, the image can be detached from the glass with a penknife in the form of a pellicle thin enough to allow prints to be taken off from either side, yet sufficiently strong. To preserve the negative on glass, the pellicle has only to be firmly pressed against a clean glass to exclude air-bubbles, and left to dry. The paper may be afterwards removed. Normal collodion or any other varnish can be applied. To make it adhere to gelatine, first roughly dry between blotting-paper, and attach the pellicle paper to a piece of gummed paper, dry thoroughly, and pull off the vehicular paper. Coat a glass with gelatine, and, when set, immerse in water, and float the pellicle on to it, expressing all air-bubbles, and dry. The gummed paper is removed by damping the back. Not having come across any similar paper offering so many advantages, I have no hesitation in recommending its use, especially in my dark-slides for pellicles, as furnishing the best results with the maximum of lightness. M. Puech, 21, Place de la Madeleine, Paris, is the agent for M. Balagny's paper.

Completion of Leon Vidal's Pocket Apparatus.—The pocket photographic apparatus which I already described in a former communication is now being constructed by a Paris house. The pattern stand, lens, and shutter are finished. I have modified my dark slides so that they may be used either for glass plates or paper and pellicles. At the request of a certain number of amateurs, I have somewhat increased the dimensions without forfeiting the claim to portability. The pictures measure seven and a half centimetres, sufficiently large for projecting on a screen. The double dark slide for plate or pellicle measures four millimetres in thickness, ninety in length, and seventy in breadth; the six slides only occupying thirty millimetres altogether in thickness.

New Material for Photographic Dishes, &c.—Experiments are being made with the substance resulting from the decoction and distillation of the bark of the silver birch. With a slight addition of gutta-percha it replaces the

entire use of this last-named substance, having the advantage of being much cheaper. With caoutchouc in combination it makes a kind of ebonite, but less brittle.

M. Liebert's Book "Photography in America."—This work of M. Liebert's, published by Tignol, has reached its fourth edition. It is illustrated with numerous and interesting specimens. As to the text, I am not yet able to remark whether it contains important additions or modifications.

LEON VIDAL.

Notes.

Few awards are so well deserved as the gold medal which the Royal Astronomical Society has accorded to Mr. Ainslie Common for his astronomical photographs. Perhaps the best of all is the "Nebula of Orion," which was issued with No. 1,319 of the PHOTOGRAPHIC NEWS.

Major Chermside, the Engineer officer who aids Admiral Hewett in the defence of Suakim, is a photographer of experience, and read a paper some twelve years ago at the Photographic Society on Arctic photography.

Egyptian earthworks and defences, as well as those of the Arabs, have been made a subject of special study by Captain Clarke R.E., who has illustrated his report by numerous photographs taken in the East.

We had in hand the other day a letter, speaking of the utility of photography in warfare, and prognosticating for the art a very wide military application. The note was dated 1868, and bore the signature of an Engineer officer, who, at the taking of San Sebastian in 1812—three years before the battle of Waterloo—enjoyed the rank of Colonel, and was in chief command of the Sappers and Miners during that memorable assault. This opinion on photography was expressed, therefore, by one of the very old school, a connecting link between the last century and this, the writer being no other than the late Field-Marshal Sir John Burgoyne.

An excellent series of photographs was taken at Victoria Station before any portion of the wreck was cleared away; and one may expect that a careful study of them will bring to light many circumstances which were overlooked in the hurried examination which preceded the clearing away of the ruins.

A young French explorer, M. Foureau, is contemplating a journey through the Sahara to Timbuctoo, and, following the Niger, to come out on the west coast of Africa. He estimates his expenses at £6,000, which will include the cost of a small steamer capable of conveyance overland. His experience as a traveller in the Sahara is already very great, added to which he is a man of considerable scientific attainments. But what will interest our readers more, is to hear that M. Foureau contemplates making extensive use of photography in his journey. He is one of the most accomplished of amateurs, and already he has mapped out and photographed the principal landmarks and oases that lie in a direct line south of the principal French routes through Algeria.

M. Foureau generally travels with a hundred plates contained in fifty light slides. He is then free from the cares of complicated changing-boxes, and has no use for a dark-room until he comes back from his flying journey. On his contemplated tour to the Niger, however, he proposes to seek the aid of an assistant, although he himself will still do all the photographic work he can. Strange to say, the only difficulty that delays his start is the flag under which he will journey. Gordon Bennett will place every facility at his disposal if he will but take the American flag with him, but, being a Frenchman, he naturally has some delicacy about doing this. He himself is willing to bear some of the expense, but wants the French Government to bear a goodly share of it. In any case, M. Foureau, with natural endowments to aid his science and experience, is the beau ideal of an explorer.

Sometimes—though, fortunately, not very often—photographers are taken to task for setting up their cameras in forbidden places on the Continent. The following letter, therefore, written from the French Embassy in London, is interesting, if only to show that tourist photographers have now-a-days nothing to fear so far as French possessions go. The official note says:—Il n'existe pas en France ou en Algérie de réglement qui puisse empêcher un voyageur de prendre les vues qui peuvent lui convenir. La seule restriction, que l'on pourrait apporter à cette liberté, concerne les fortifications ou travaux de défense, et dans ce cas le Ministre de la Guerre pourrait seul donner les autorisations nécessaires."

In respect to her galleries and museums, France is even more liberal than we are. It is possible, by the mere asking, to carry a camera into the majority of the fine art galleries, and copy works of art. That is to say, the authorisation is rarely refused to any one who will sign the official regulations drawn up for the guidance of photographers, the principal rule being that only dry plates be used in the work. In these days of gelatine, this regulation will fetter no one.

Mr. H. H. Cunningham, having accepted the appointment of Stipendiary Magistrate in British Guiana, has resigned his post as Hon. Sec. to the Postal Photographic Society. Pending the selection of his successor, communications should, we are informed, be addressed to the Hon. Treasurer, Mr. W. M. Baylis, 3, Plowden Buildings, Temple.

In a paper read at the Photographic Society in 1880, the Rev. T. F. Hardwich spoke strongly of the absolute safety of the blow-through form of the oxy-hydrogen apparatus. In the discussion which followed, his views did not meet with acceptance, and Mr. Cadett, Mr. Norton, and several others gave instances of the contrary. The lamentable accident at Oldham—the actor in which, it may be men-

tioned, was a photographer—is sufficient to prove that extreme caution is needed in the manipulation of the gas bags. Whether or not the accident was due, as asserted, to the displacement of a heavy weight on the oxygen bag, and so causing a "suck back," it is pretty certain that lantern exhibitions are attended with danger.

It is needless to say anything as to the danger attending the use of the mixed gases, as all admit it; but more or less risk seems to accompany the use of oxygen in almost every case. If it is stored in an old rubber bag an explosive mixture is extremely liable to arise through the presence of a combustible dust, formed from the disintegration of the rubber, while a zinc gas-holder is not safe, as hydrogen is gradually liberated by the action of the metal upon water. The iron bottle is perhaps the most suggestive of danger, as if a spark reaches the interior the iron burns, and as the bottle becomes weakened, it bursts with a terrific explosion. In the case of the iron bottle which burst some years ago at the laboratory of the Royal Institution, the iron was kindled by the heat occasioned during the compression of the gas. We are informed that it was an ether-oxygen arrangement which occasioned the accident at Oldham, and the principal force of the explosion was exerted downward, the apparatus having been forced through the floor.

The dispute between M. Meissonnier and Mrs. Mackay touches a point on which photographers are much interested. Ought a photographer to yield to what he believes is caprice or vanity on the part of a sitter, and give the latter a re-sitting, though he feels the portrait found fault with is both truthful and artistic? Theoretically, most would hold that he ought not, but practically, the majority of photographers find themselves forced continually to make the concession. The main point, after all, is to please one's customers, and unless one happens to be a Meissonnier, and can afford to be independent, it does not pay not to be so. A good test as to the sincerity of the motive for re-sitting is to insist upon the destruction of the first negative and print. This will cause the sitter to think twice, and will prevent the disagreeable announcement by the sitter, after an immensity of trouble has been taken, "Well, I think, after all, I prefer the first portrait."

It is worthy of note that, with very few exceptions, when disputes on this point are settled in the Law Courts, the decision of the judge upholds the opinion of the photographer. Only last week a case was heard in the City of London Court, where the Stereoscopic Company brought an action to recover the price charged for photographing a stall at the Fisheries Exhibition. The defence was that the photograph was not properly taken, the particular fault being that it was too light. Mr. Commissioner Kerr, who has an awkward habit of calling a spade a spade, said this was all "rubbish," and that he had never seen a photograph taken better. It is true that the photograph in this case was not a portrait, but fanciful objections are not confined to portraits.

The official scheme for the organization of the Central Institution of the City and Guilds of London Institute has been issued. It recommends that practical laboratory instruction be given in these branches of industry in which artistic effects are produced by a combination of art with processes involving applications of science, such as photo-engraving on metals, photo-lithography, and photography.

A photographic exhibition is to take place in Northampton in December next, and applications for space should be addressed to Mr. H. Manfield, The Museum, Northampton. Northampton possesses no photographic society, but it has had for some time past a "photographic section" attached to the local "National History Club," and the members have decided to hold a Photographic Exhibition. Particulars will be found in another place.

In Italy they do not quite seem to fathom the value of photographic portraits as a means of identification by the police. A young Englishman has disappeared in Rome, and his friends are naturally anxious to find him. What better aid could the police have in their mission of search than a few photographs of the missing one? Accordingly the friend sent post haste to a photographer, requesting an immediate supply of copies from a certain negative. One hundred and fifty copies of the portrait were sent to Rome forthwith, and the friends congratulated themselves on their promptitude. But it appears that the Roman police had no idea that the pictures were to serve any useful purpose, and treated them as a gift from certain eccentric Englishmen.

A French amateur of our acquaintance has a very simple way of measuring his pyrogallic acid. He finds that the little bone spoons shaped like a spade that usually take the place of mustard spoons in France, hold as nearly as possible a gramme of pyrogallol, and therefore he calculates by spoonfuls instead of grammes. A powder like pyrogallic acid heaps itself very uniformly, and therefore the plan may be trusted with some certainty; if the little measure can be relied upon, there is no necessity to weigh your pyrogallol nine times out of ten.

Patent Intelligence.

Applications for Provisional Protection.

3722. James Sturrock, of Dundee, in the county of Forfar, North Britain, for an invention for "Improvements in apparatus for changing the sensitive plates in photographic cameras."—Dated 21st February, 1884.

3865. Thomas James, 37, Renshaw Street, Liverpool, county of Lancashire, sewing machine agent, for "Improved phototype blocks to print in the ordinary type press, to produce half-tones and gradations."—Dated 25th February, 1884.

3866. Josiah William Saunders, David Thomas Davies, and James Alexander Macdonald, trading as Saunders, Davies, and Macdonald, of Ryland Works, Upper Tower Street, Birmingham, brassfounders, for "Improvements in head-rests for perambulators, invalids' chairs, barbers' and photographers' chairs, and for other like purposes."—Dated 25th February, 1884.

Patents Filed 28th February, 1884.

4152. EUGENIO DE ZUCCATO, of Charterhouse Street, in the city of London, for an invention of "An improved method or process of producing prints or transfers of photographic pictures." —Dated 28th August, 1883.

My invention relates to an improved method or process of producing prints or transfers of photographic pictures, and is carried into practice in the following manner; that is to say, I take what is known as a "Woodburytype relief" of the picture of which it is desired to print a transfer, and I lay this relief upon a sheet of paper or analogous material, placed on a slab or plate (such as those hereinafter described), having a smooth surface, which is inked with printer's ink so as to form a grain, stipple, or series of closely-packed lines or dots; I then press the said relief, the paper, and the slab or plate together by suitable mechanical means, whereupon the printer's ink will more or less completely "set off," and be impressed on the paper or analogous material, and thus form a grained, stippled, or lined picture, or ink-photo-print corresponding to the said "Woodburytype relief." This grained, stippled, or lined image, or picture, may then be transferred to metal or lithographic stone by any method known to printers; or the grained, stippled, or lined image or picture may be photographed, and a transfer made therefrom by any method known to photo-lithographers and photo-zincographers. The term "Woodburytype relief" is understood by photographic printers, but to prevent any misapprehension I desire to state that I mean a gelatine film in which the varying tints of a photograph are represented by varying thicknesses of gelatine, or any substitute for the said "Woodburytype relief," such as a cast or mould. The materials which, for the purposes of my invention, I regard as analogous to paper, are such thin, flexible, or yielding materials as will readily take an impression in printer's ink. Among these may be mentioned tracing cloth, ribbed or grained transfer paper, tin or other foil, gold-beater's skin, silk fabric, or other suitable tissue. To explain what I mean by "a slab or plate having a smooth surface which is inked with printer's ink so as to form a grain, stipple, or series of closely-packed lines or dots," I quote the following as examples, viz.:—

1. A lithographer's stone upon which a stipple or lined ground of any kind is imprinted
2. A zinc plate upon which a stipple or lined ground of any kind is imprinted.
3. A slab of any kind upon which a tint or stipple in printer's ink has been inscribed or transferred.
4. A slab or sheet of paper, either enamelled or plain, upon which a tint or stipple in printer's ink has been impressed, inscribed, or transferred.

By the term "printer's ink" I mean any ordinary printing ink in which a pigment is incorporated with an oily vehicle; or similar fatty inks such as are especially made and sold for the purpose of transferring. When I re-photograph the ink-photo-print, I sometimes use an ink of which the vehicle is glycerine, mucilage, or a similar substance. Soft wax, fat, varnish, soap, or a mixture of these materials, may in some cases be used in place of ink when the image is to be transferred to stone or metal. Having thus fully described my said invention, and the manner of performing the same, I wish it understood that I claim—The production of a picture or transfer by pressing paper or analogous material between a "Woodburytype relief," and a slab or plate lined, grained, or stippled with ink, substantially as described.

4153. EUGENIO DE ZUCCATO, of Charterhouse Street, in the city of London, for an invention of "An improved method or process of producing prints or transfers of photographic pictures."—Dated 28th August, 1883.

My invention relates to an improved method or process of producing prints or transfers of photographic pictures, and is carried into practice in the following manner. That is to say, I saturate or ink a piece of fine network or other textile fabric either with printers' ink or with a transfer ink, such as is used by lithographers, care being taken that none of the meshes or ribs of the fabric are blocked up with ink, but that each rib or thread is well saturated. This inked fabric is placed in contact with a sheet of paper; and either upon the said paper, or upon the inked material, I place a "Woodburytype relief," and the whole is then subjected to pressure by suitable mechanical means. I can so vary the working of my invention as to ink the "Woodburytype relief" itself; but, in this case, the paper or analogous material must always be placed between the relief and the fabric. The pressure causes the ink to "set off" from the inked material on to the paper, upon which is thus formed a picture in a kind of stipple corresponding to the "Woodburytype relief." This stippled picture is then either transferred to metal or stone by any method known to printers, or it may be photographed, and a second transfer in fatty ink made by methods known to photo-lithographers and photo-zincographers. I can, if desired, so practise my invention as to obtain the grained or stippled image directly upon a plate of zinc or other metal, or upon a lithographic stone. For this purpose, I first lay the inked fabric upon the plate or stone; I then place the "Woodburytype relief" upon the said inked fabric, and apply pressure by suitable mechanical means as before. Fine wire gauze may, in some cases, be used in place of the textile fabric, and I may mention silk gauze, ribbed silk, ribbed or grained transfer paper, and bookbinder's cloth as examples of the fabrics I use—such fabrics as are thin, yielding, and flexible, being best adapted to the purposes of my invention. The term "Woodburytype relief" is understood by photographic printers; but, to prevent any misapprehension, I desire to state that I mean a gelatine film in which the varying tints of a photograph are represented by varying thicknesses of gelatine, or any substitute for the said "Woodburytype relief," such as a cast or mould. Those materials which for the purposes of my invention I regard as analogous to paper, are such thin, flexible, and yielding materials as will readily take an impression in printer's ink. Among these may be mentioned tracing cloth, tin or other foil, gold-beater's skin, a collodion pelliele, silk, fabric, or other suitable tissue. By printer's ink I mean any ordinary printing ink in which a pigment is incorporated with an oily vehicle; or similar fatty inks such as are especially made and sold for the purposes of transferring. When I re-photograph the ink-photo-print, I sometimes use an iuk of which the vehicle is glycerine, mucilage, or similar substauce. Soft wax, fat, varnish, soap, or a mixture of thesc materials may, in some cases, replace ink when the image is to be transferred to stone or metal.

Having thus described my invention, I claim—

First. The production of a picture or transfer by pressiug an inked textile fabric or the like against paper, or other suitable material, by means of a "Woodburytype relief," substantially as described.

Second. The production of a print or transfer on paper or analogous material, which is pressed between a textile fabric or the like, and an inked "Woodburytype relief," substantially as described.

4154. EUGENIO DE ZUCCATO, of Charterhouse Street, in the city of London, for an invention of "An improved method or process of producing prints or transfers of photographic pictures."—Dated 28th August, 1883.

My invention relates to an improved method or process of producing prints or transfers of photographic pictures, and is carried into practice in the following manuer. That is to say, I take what is known as a "Woodburytype relief" of the picture desired to be printed or transferred, aud I lay this relief upon a sheet of paper or analogous material, and on the other side of this paper or other material I place a roughened, grained, stippled, or lined plate, which has been inked on its roughened side with printer's iuk. The roughened side of the plate must be next the paper or analogous material. I then press the said relief, the paper, and the inky roughened plate together by suitable mechanical means, whereupon the printer's ink will "set off" or be impressed on the paper or analogous material, and thus form a grained, stippled, or lined picture or ink-photo-print corresponding to the Woodburytype relief. This grained, stippled, or lined image or picture may be transferred to metal or lithographic stone by auy method known to printers; or the grained, stippled, or liued image or picture may be photographed, and a transfer made therefrom by any methods known to photo-lithographers and photo-zincographers. The term "Woodburytype relief" is understood by photographic printers, but to prevent any misapprehension, I desire to state that I mean a gelatine film in which the varying tints of a photograph are represented by varying thicknesses of gelatine, or any substitute for the said Woodburytype relief, such as a mould or cast. Those materials which, for the purposes of my invention, I regard as analogous to paper, are such thin, flexible, or yielding materials as will readily take an impression in printer's ink. Among these may be mentioned tracing cloth, tin or other foil, gold-beaters' skins, silk fabric, or other suitable tissue. By a grained, stippled, or lined plate I mean a plate of any moderately hard material, of which at least one surface is roughened, grained, or lined. As examples, I may on the one hand mention a metal plate or block of wood which has been grooved or stippled, a cast of this plate or block in

ebonite, dry gelatine, or celluloid; and on the other hand, a sheet of emery cloth, sand-paper, or bookbinder's cloth. By printer's ink I mean any ordinary printing ink in which a pigment is incorporated with an oily vehicle; or similar fatty inks such as are especially made and sold for the purposes of transferring. When I re-photograph the ink-photo-print, I sometimes use an ink of which the vehicle is glycerine, mucilage, or a similar substance. Soft wax, fat, varnish, soap, or a mixture of these materials, may in some cases replace ink when the image is to be transferred to stone or metal. Having thus fully described my said invention, and the manner of performing the same, I wish it understood that I claim—

The production of a picture or transfer by pressing paper or other suitable material against an inked roughened plate or the like by means of a "Woodburytype relief," substantially as described.

CHAPTERS ON LANDSCAPE AND OUT-DOOR PHOTOGRAPHY.

BY H. P. ROBINSON.

No. 8.—Animals.

When Landseer asked Sydney Smith—to whom all witty sayings are attributed—to sit to him for a portrait, the Canon of St. Paul's replied: "Is thy servant a dog, that he should do this thing?" A fair suggestion that the great animal painter may not be able to render the human face divine. Will the time ever come when the several branches of photography shall have their distinct professors? Will the landscape man ever boast that he can also photograph the figure, as some landscape painters now pride themselves on their drawing of the human form, as something exceptional? Will the portrait photographer ever find himself so entranced by his portion of the art that he can never find time to do a bit of landscape or architecture? If ever any student of our art finds himself compelled to confine himself to one department, it will be the animal photographer. Just as Mark Twain says, there is more *to* a blue jay than any other bird, so there is more *to* animals, from a photographic point of view, than all the rest of creation. If you want to get the best results, you must make a more minute study of your "sitters" than is necessary even with the superior animal—man. You cannot expect to get the best expression out of a Scotch terrier at your first interview, or the amiable purr of a cat at an early acquaintance. Sir Joshua Reynolds found it of great assistance to him in getting the best and most characteristic portraits of his sitters to dine and spend the evening with them; so with what we complimentarily call the brute creation, we cannot expect to get the best results if we come upon them, camera in hand, as total strangers.

There are few animals that cannot be photographed, as Mr. York and Mr. Dixon have shown in their marvellous pictures of animals taken in the Zoological Gardens; but it is not of "wild beasts" that I have anything to say here. It is the domestic animal that is more likely to engage the attention of those for whom I write. Infinite care and patience are required to photograph animals: but some are much more difficult than others. It is seldom, for instance, that a cat will allow herself to be approached by a stranger on photographic thoughts intent; while it is imagining a vain thing to take her to the studio or other strange place for the purpose of having her portrait taken. Of all the domestic animals, the cat insists most on having an "At Home" portrait. The dog is different. He does not care where he has his portrait taken, so that it is done in the least possible time, and without much fuss. The large dogs, as a rule, take it in a lazy, contemplative manner; while the small dogs—by far the most difficult—seem to want to know all about it, and are not easily controlled or kept within range of the focus. It is difficult in writing to give any suggestions about the management of any animals "under the lens"; but you may take it as a rule that violent noises used to attract the attention of dogs will have a contrary effect to the one intended. A quiet little noise made with the mouth, scratching a paper, or gentle rapping out of sight, will almost always make a dog look up; indeed, it is scarcely too much to say that expression may be controlled by these or similar means; while everybody knows the exciting influence of the word "rats" on dogs of the terrier kind. But this should always be kept as a last resource, for no well-educated terrier can sit still for long, however obedient he might be, when he hears the word "rats" whispered in however gentle a tone. A panting dog is always a nuisance to the photographer. This difficulty may sometimes be removed by a drink; but the water should be given just before the exposure is to take place, as the effect soon wears off. It may be partly checked by keeping the dog from running about for some time before the operation. Very much more characteristic pictures of dogs ought to be got, now we can take snap shots at them, than in the olden times.

Of all animals taken to the photographer, the horse is the most frequent. Everybody who has a horse thinks it the best horse of the kind ever invented, and wants its portrait. It is fortunate that he is a good sitter. The photographer has nothing to do but to see that the position is easy—for even horses can pose—and that the expression is bright. A horse cannot smile, but he can do a good deal in the way of expression with his ears and the pose of the head. The one thing to look out for is, if possible, to get the four legs to show. It often happens that the two near legs hide the other two, and the horse looks as if he were standing on two pegs. A horse standing so is exceedingly ugly; but there is a fashion even in the way horses stand, and I lately refused to photograph a lady on a horse because her groom insisted that the horse should stand with the legs level, and stuck out at both ends of the animal in the fashionable way.

Horses are easily kept still. They will prick up their ears and listen to a noise—either the shaking of a newspaper or a whistle—for almost any length of exposure. There are some fidgety horses that nothing will keep quiet, but, fortunately, they are not numerous. Many will champ the bit unceasingly; but this can sometimes be prevented by loosening the curb. The real worry comes from the incessant whisking of the tail in hot weather, when flies are troublesome. The only way to get over this is to take the horse on a cooler and cloudy day. If a portrait of the horse is required, it is much better to do it out of the sun. The violent light and shade of sunshine is apt to spoil the likeness.

With the painter, cattle-pieces have always been favourites. The names of Cuyp, Paul Potter, Ward, and Cooper, recal triumphs in cattle-painting in generations that are past or passing, while the modern school, so different from its predecessors as to be almost a new art, has its constant admirers. But by whatever school they are produced, pictures containing cattle and sheep will always find favour with the country-loving English people. Now I do not know that photographers have yet offered to the public anything very admirable in the way of cattle-pieces. If they have been produced, they have certainly not appeared in our exhibitions. Mr. Berkeley has shown us in one little gem which he called "Noon," a perfect group of cattle in a stream; Mr. Gale has turned agricultural horses to good pictorial account, and a few sheep are found occasionally in landscapes; but the great cattle photographer has not yet arisen. Capital pictures could be obtained: the things required are opportunity, patience, and skill. The photographer who wants to succeed must make his opportunities, and he possesses the two other qualifications, or he is not in a state to gain much advantage from reading this book. A fortnight's residence at a farmhouse ought to put many fine subjects in the student's way. Milking time is always a good subject, one that comes ever fresh, however treated. "Feeding" is a theme that always supplies food for the artist. Feeding cattle—feeding pigs—feeding sheep (a splendid snow subject)—

feeding chickens—feeding pigeons, ducks, and geese; there is no end to the opportunities these operations afford.

In taking such photographs of animals as are here suggested, don't forget that your object is not so much to get a portrait of a difficult subject, as to make a picture. There are some who think that if they succeed in getting the beast still, they have done all that is proposed; but this is only a very minor detail—there is composition, light and shade, and all that goes to make a picture, to be considered. A group of sheep in a level meadow, lighted flatly from in front, would be worthless as a picture; while the same sheep viewed from the other side, with the light just edging their backs, might be very picturesque. Sheep are easily managed, and very useful in a landscape. If a group are lying in a row, or in positions that do not "compose," walking a few steps towards them will induce a few of them to rise and look about, giving the photographer the effect he wants. If they are inclined to straggle and escape, a judicious assistant, by quietly walking round them, can easily induce the group to remain, while the imitation of the bark of a dog, or a whistle, will quickly produce life and expression without frightening them away. Cows, when in the open, are rather more difficult to manage. They are given to bolting; but they are not entirely unmanageable. But whether easy to get at or difficult, refrain from exposing the plates if the "effect" is not good—the world is already flooded with indifferent photographs.

LESSONS IN OPTICS FOR PHOTOGRAPHERS.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

LESSON X.

Illumination of the Field when Using a Stop.—With a single lens, whether in the rear or in front of a lens, there is not much difficulty in calculating the brightness of an image, compared to that which would be given with a full aperture. Let us take as an example the case of a lens with a stop in front, which is usually the position in single lenses.

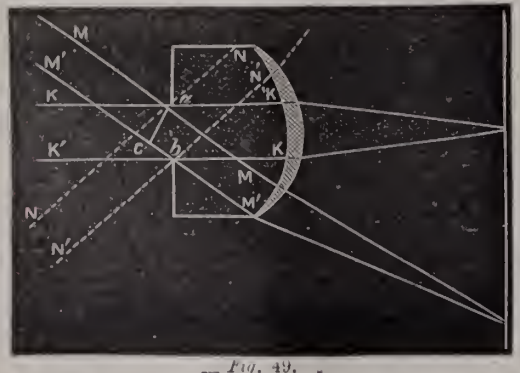


Fig. 49.

Let *a b* be the diaphragm in front of the lens shown in section, and suppose that we have a point lying in the same plane as that of the paper, and their direction in one case in the axis of the lens, and in another above the axis. These two positions are representative, since the section of the lens may be taken at any part through its axis. Let *K K*, *K*$_1$ *K*$_1$ be parallel rays coming from the point in the axis, and M M, M^1 M^1 parallel rays coming from the point above the axis. Then it is evident that in the vertical direction the available aperture in the first case is *a b*, and in the latter only *a c*, whilst the full aperture will be available in both cases in the horizontal direction. Thus the aperture which is circular as seen along the axis, is elliptical when seen along the direction M M, or in any direction other than the axis. Now, the area of a circle is to that of an ellipse as the square of the diameter of the one to the product of the least and greatest diameter of the other. In the case in point, the greatest diameter of the latter is the same as the diameter of the circle. Therefore the available aperture along the axis is to that along the direction M M, as *a b* to *a c*.

[Mathematically it may be expressed thus. Let θ be the angle which the direction of every ray makes with the axis, and *a* be the diameter of the aperture; then the available aperture for the inclined rays is cos θ times that available along the axis.

Example 1.—Rays falling at an angle of 30° with the axis from a distant point, and also along the axis, come from distant points: what is the available aperture in the two cases, supposing the area of the aperture to be unity?

$$\cos 30° = \cdot 886.$$

Therefore the image of the point away from the axis will only be ·866 times as bright as the central image, that is, about $\frac{7}{8}$ as bright.

Example 2.—In a wide-angle lens the angle embraced is 90° at times; find the ratio of available apertures as before for two points of light, one lying in the axis, and the other 45° from it.

$$\theta = 45° \text{ and } \cos\theta = \cdot 707]$$

From this cause alone, then, there would be a diminution of intensity of illumination at the margins of a plate in comparison with that at the centre; but there is still another reason why it is diminished. If the plate were spherical, so that the refracted beam always struck at the same distance from near the optical centre of the lens, this diminution of the aperture for oblique rays would be a measure of the diminution of illumination; but the rays are received on a plane, which makes an angle with them, and the image is therefore spread over a larger surface, and the distance of the image is further from the lens. If a single lens be used without a stop, there would still be a difference in illumination from the same cause as above described.

[Approximately it may be taken that the angle that the ray makes with the plate is the complement of the angle which the incident ray make with the axis of the lens, and it will be readily seen that the image is spread out to an area $\frac{1}{\cos\theta}$; when θ is the angle of incidence, the illumination of the centre of the field to that making an angle of θ with the field is as 1 to cos θ on this account; and owing to the diminution of available aperture, we have already shown it was as 1 to cos θ: therefore the comparative total illuminations due to both causes are as 1 to $\cos^2\theta$.

In the examples given above, the illumination of the field would be 1 to ·886^2, or 1 to $\frac{3}{4}$; and 1 to ·707^2, or 1 to $\frac{1}{2}$.

It will be evident, then, that as the inclination of the rays to the axis increases, so will the illumination fall off on this account alone. Thus, with a wide-angle lens embracing 90°, as in the example, if the central portion of a plate was just sufficiently exposed in five seconds, the margins would require ten seconds to give equally good exposure. In practice, this falling off of the exposure is often visible in negatives taken with a wide-angle lens.

Another point to be taken into consideration is this: the size of plate which is used should never exceed that in which the whole of the rays, going through a diaphragm, strike the lens. Thus, a point lying in the direction NN would strike part of the lens and partly the mount, hence there would be a vast falling off of illumination, of course very much greater than that calculated above.

The Effect of any Stop other than a Circular One.—It has often been proposed, but not quite so often been condemned, to use a slit or rectangular diaphragm instead of a circular one. It may be worth while for a moment to see what this leads to, as one of the principal objects of a stop is to do away with the evil effects of spherical aberration and astigmatism. If, then, a rectangular stop be used, one side of which is longer than another, it is evident that the projection of that aperture on to the lens will be rectangular. If, in the shortest dimensions, it is just capable

of giving definition in one direction, it is evident that in the direction at right angles to it there must be want of definition. Or again, if the longest dimension be capable of giving definition, then the shortest side of the rectangle must be needlessly small. It may be said that this being so, a square is the best shape to give; but it must be recollected that the diagonals are longer than the sides, and the same argument applies as before. Hence we are driven to the conclusion that a circular form is the best. Sometimes it is an advantage to give the foreground a slightly longer exposure than the sky, and it has been proposed to incline the stop at such an angle that it shall appear circular to rays coming from the foreground. In such a case, a smaller stop would have to be used, and thus a longer exposure would be necessary. The best means of securing this advantage is by a flap shutter in front of the lens, or by some other kindred contrivance. For our own part, we say, keep your stops vertical by all means, as then you can take the fullest advantage of the lens you are using.

Working Aperture of Stops in a Double Combination.—The real working size of a stop in a double lens cannot be accurately guaged by its character in relation to the full aperture. The plan to adopt is to accurately focus a distant object, then to replace the focussing screen by a sheet of cardboard in which a small hole has been punched in the axis of the lens.* On the front lens will appear a circle of light when a candle flame is held near the hole, and the diameter of this should be taken as the working aperture of the diaphragm (stop). The front lens may be removed if necessary, and a piece of translucent writing-paper substituted for it, when the measurements can very readily be made.

(To be continued.)

Review.

DIE BROMSILBER-GELATINE. Ihre Bereitung und Anwendung zu photographischen Aufnahmen. Vierte Auflage. *Von Dr. Paul E. Liesegang.*

WE have here a new edition of an excellent little manual of the gelatine-bromide method, and those of our readers who can conveniently work from a German handbook will find much that is useful. The chapter on failures is very comprehensive and well arranged, and we find full information on such subjects as the reproduction of negatives, enlarging, and the treatment of residues.

Some interesting historical notes as to the discovery of the gelatine process are to be found in the book, and it is curious to note that the earliest experiments recorded were made by Niépce de St. Victor in 1847, but these experiments seem to have relinquished been because the film dissolved too easily in water. Niépce said that gelatino-iodide plates give remarkably clear images.

We cordially recommend Dr. Liesegang's excellent little handbook.

A Dictionary of Photography.

ALBUMENIZED PAPER (Printing on).—*Continued.*

Before quitting the subject of enamelling, it will be well to give directions for removing the white and other spots caused by dust in printing and imperfections in the negative. Water colours may be used for the purpose, provided the medium cannot be easily removed by water. Such a substance we have in spike oil of lavender. For white spots, mix India ink, Indian red, and neutral tint with spike oil of lavender to the consistency of cream; test it for shade of colour by touching ont a white spot. Use a sable brush with good point. Let the brush be charged freely with colour, and then worked nearly dry on the palette; by adopting this measure, the beginner will soon be able to touch prints successfully, an achievement he would not attain if the brush were loaded with colour. In the latter case, he would take out a white spot, and put in a black one—a circumstance sometimes met with among professional spotters. If the colour is the same shade as the photograph, then proceed to remove all the white spots, levelling them carefully into the surrounding parts. Dark spots may be lightened with Chinese or zinc white and Indian red mixed with spike oil as before. All the working up that is intended to put on the print should be done after mounting, and before soaking in the vessel of cold water. Another vehicle is sometimes used for mixing the colours, viz., gelatine containing a small proportion of chhome alum to render it insoluble. There are other methods of obtaining enamelled surfaces, differing from the foregoing, inasmuch as the vehicle gelatine is dispensed with in one, and both gelatine and collodion in another. In the former case, the glass is coated with wax in one of its solvents (either benzoline spirit, or methylated ether will do), over this the plate receives a film of plain collodion in which the solvents are about equally proportioned. Thus:—

Pyroxyline (Hopkins and Williams) ...	¼ ounce
Methylated alcohol	... 10 ounces
„ ether	... 10 „
Castor oil	... 20 drops

Moisten the cotton with 2 ounces of alcohol, then add the ether. Finally add the remaining 8 ounces of alcohol in which the castor oil has been previously dissolved. When set, it should be washed in cold water until, when water is poured on, streaks and greasy lines have disappeared.

Unmounted prints previously soaked in water are to be placed wet, in contact with the plate, in the same manner described above, water being the vehicle this time instead of gelatine. Upon examining the front, no small spots should be visible, said spots being air-bubbles. Cover the back with two thicknesses of note-paper, or one of American cloth; squeeg[illegible] thoroughly, and set aside to dry. The other plan, which disp[illegible] with both collodion and gelatine, has only been recently bro[illegible] under the notice of one of the photographic societies, and therefore may be new to many besides beginners.

The glass plate is well polished with tripoli or one of the usual plate-cleaning substances. It is then dusted all over with finely-powdered French chalk, the talc being formed into a pad with flannel, which should be used to do the polishing; the plate should then be immersed in a vessel of water. A well soaked print, placed in contact with the plate as previously described, will adhere so long as moisture be present; when dry, which will happen in the course of an hour in a warm room, the print will drop off. Prints treated with collodion alone may have mounts attached to them by means of either starch, glue, or gelatine, by brushing the mountant on the mount and print, and when rubbed down in contact, put under pressure for an hour. But when neither collodion nor gelatine is used, as in the last method, the plate requires to be coated with some suitable substance on the talc, to prevent the print sticking fast to the glass. If it be desired to attach a mount, the alcoholic soap solution used for burnishing will be found to answer the purpose effectually, preventing the mountant permeating through to the glass, or, rather, holding on to it.

Spotting.—This may take place either before or after rolling, if that mode of finishing be adopted; but many persons prefer to do the spotting first, in order that, when finished, the surface shall be equal, or, in other words, the dull marks caused by the spotting-out brush will not show. The same may be said in the case of burnishing; but if the burnisher is used very hot, the touching colour will become a shade warmer than the photograph, necessitating its removal. As the print in such a case would require re-spotting on the burnished surface with a suitable colour, to match the colour of the photograph, and containing more gum, obviously the time occupied in the first work would be wasted; therefore, one or two trials may be made to indicate the shade of colour necessary to match prints of any particular tone. Moreover, it will be found easier to touch out a spot on an unrolled print, on account of the surface being more spongey. The colours employed are Indian ink, Indian red, and neutral tint, mixed with dilute gum water or albumen until the desired tint is obtained. Ivory black may be added if desired. For warm-toned photographs Indian red will predominate, whereas blue or grey-toned photographs require a larger proportion of neutral tint. The lakes, although useful for obtaining exact shades, are not sufficiently

* This may be quite closely enough to be formed by ruling to lines to the opposite angles of the card, and taking the point of intersection as the axis.

permanent, therefore do not use them; all that is necessary can be easily done by means of the above mixture. Commence by lightly stippling out a white spot in the half-tint, using only the point of a small sable pencil charged as previously described for the purpose. When finished, it should be difficult to detect where the spot existed; but if it is visible, and just a trifle lighter, it may be remedied by one or two light touches of the brush, after taking up the smallest possible quantity of colour from the palette. On the contrary, if the spot is easily discerned by being darker than the surrounding portion, remove it entirely, and start afresh. Patience is absolutely necessary if one wishes to spot prints well, for it is certainly a tedious operation; therefore, we say, persevere with the first spot until perfection has been attained, then all the others will become easier.

Next to spots, it may be necessary to subdue a too prominent light, which we will call a patch; when small, stipple in with the point of a brush slightly charged with colour; but when the patch to be worked on is large, cross hatching will be found quicker and better. Charge the brush well with colour, and make short strokes in the same manner as the down strokes of a pen, commencing at the top with three short strokes, crossing them with two in the opposite direction. Proceed in this way until the patch has been covered; when dry, stipple lightly between the short strokes by means of a fine-pointed brush containing very little colour, until the whole is perfectly levelled. Black spots may be covered with Chinese white slightly toned down with a little of the ordinary touching colour. Working up to almost any extent may be performed by persons possessing the necessary taste and skill. Shadows can be strengthened with neutral tint, or ivory black mixed with gum; lights may be worked over with Chinese white, the middle tints stippled with ordinary touching-out colour and, where needed, such as the shadows in the face, a mixture of black and white. Whether spotting is done before or after rolling or burnishing, an encaustic paste is useful to have ready, for several reasons; dull spots caused by extra touching, or by finger marks, may be easily removed, the surface becoming brighter than with burnishing alone. What is of greater importance, however, is the permanence it is said to confer. Many persons claim that when the pores of the paper are filled with wax, the photograph is protected, to a large extent, from atmospheric influences. Besides polishing photographs, it will polish the apparatus, if applied with a little friction.

Encaustic paste is essentialty bee's-wax reduced to a paste with one of its solvents, such as turpentine, and however much it may savour of furniture cleaning, it will be found quite as useful for putting a fine polish on a photograph, let it be new or old. An excellent paste is made as follows:—

White wax	1 ounce
Turpentine	5 ounces

Dissolved by gently heating over a water bath; when cold, it is ready for use. If the smell of turpentine is objectionable, one ounce of spike oil of lavender may be substituted for a similar quantity of turpentine: the result will be the same. Apply the paste to the photograph by means of a small piece of flannel, rubbing it lengthways, but all over; then work in a circular direction, using the same flannel, until the wax appears to be all rubbed into the print. Make a pad of clean flannel, and lay on the friction for a few seconds, working as before in a circular direction; if you get tired, don't make a halt on the print, or it may cause a mark; if the polish is not satisfactory, apply more wax, and repeat the operation, finishing off with a clean piece of old cambric.

Everyone has heard of Adam-Salomon, the great master in portrait photography, and who has not heard of his celebrated encaustic paste? In case there be such, we will give the formula for his benefit:—

Pure virgin wax	500 parts
Gum elemi	10 „
Benzole	200 „
Essence of lavender	300 „
Spike oil of lavender	15 „

Melt on a water bath, mixing thoroughly, and strain through muslin; or the gum elemi may be dissolved in the solvents, and ths melted wax added after filtration; to make it thinner, add a little more essence of lavender.

The silver printer should read the article RETOUCHING, as most negatives are improved by a little work. Reference should also be made to RESIDUES and SILVER SOLUTIONS.

Proceedings of Societies.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

A MEETING was held at the Gallery, 5A, Pall Mall, East, on Tuesday last, the 26th inst., Mr. SEBASTIAN DAVIS in the chair.

The CHAIRMAN said they intended to give those who were present an opportunity of judging as to the value of the simple forms of lantern in which oil light is used. For educational purposes or exhibition in a small room, the oil-lamp gives an ample light, and Mr. Davis had found that almond oil answers well as a fuel for the lamp, giving a soft and agreeable light. One disadvantage of the oil lamp in comparison with the lime-light arises from the circumstance that when the radiant is large, it is difficult to realise those optical conditions which give rise to an uniformly-lighted disc. The paraffine lamp has been much modified for lantern work, but principally by re-duplicating the burner.

Some slides were then projected on the screen, various lanterns being used. Mr. Davis' lamp, burning almond oil, did not give quite such a brilliant light as the Sciopticon Lantern belonging to the Society, but the illumination was more uniform in the case of Mr. Davis' lantern. Other paraffine lanterns were tried, but those having three or four wicks respectively did not show any corresponding advantage over the Sciopticon.

Among the slides shown were some on gelatino-bromide plates by the method of Mr. J. W. Wellington (see page 79). Those which had received a short exposure with quick development were cold and greyish in tone, while in the cases where the exposure had been increased fifty or eighty fold, and the development had been very slow, a rich red tone resulted. For the composition of the developer, see below.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 21st inst., Mr. F. PIPER occupying the chair.

Mr. J. B. B. WELLINGTON exhibited several transparencies printed by contact, the tones ranging from black to red.

In reply to questions, Mr. WELLINGTON stated that he used bromide plates prepared according to the formulæ he gave at the meeting held on the 24th ult. The developer used was a modification of ferrous-oxalate, as follows (3 parts of No. 1 to 1 part of No. 2.):—

No. 1.

Oxalate of potash	2 ounces
Chloride of ammonium	20 grains
Water	20 ounces

No. 2.

Sulphate of iron	4 drachms
Citric acid...	2 „
Water	20 ounces

The difference in tone was obtained by varying the proportions of restrainer (bromide of potassium) and the time of exposure.

Mr. W. E. DEBENHAM enquired if Mr. Wellington had made any experiments of this kind on ordinary gelatino-bromide plates? It would be interesting to see if the same results could be obtained.

Mr. WELLINGTON had not experimented with ordinary plates.

Mr. DEBENHAM considered it a very decided move to be able to get such qualities.

Mr. A. L. HENDERSON said there appeared to be distinct qualities peculiar to chloride and bromide of silver, either of which for particular purposes were advantageous; possibly the two might be combined. Speaking of restrainers, he said the most powerful restrainer he knew was boracic acid.

Mr. WELLINGTON: How much stronger is it than bromide of potassium?

Mr. HENDERSON could not give the relative restraining power, but it is almost unworkable, it is so powerful. Speaking of canary medium, he had exposed two plates 7½, 15, and 22½ minutes respectively to light emitted from a gas jet placed two feet behind the canary medium; the plates being exposed six feet from the medium, an excellent light was obtained, and safe enough for all practical purposes, there being no indication of fog. Mr. Cowan developed one, and he the other. Mr. Cowan said he exposed his plate in the camera masked, before developing, there was no trace of fog. There were 200 square inches of light.

The CHAIRMAN'S experience differed from that of Messrs. Henderson and Cowan; he obtained a transparency after twenty minutes' exposure to canary medium, illuminated by a paraffin lamp; the flame was one foot from the medium, and the exposure made at eighteen inches from the light.

Mr. DEBENHAM was of opinion that yellow light is the most suitable for bromide plates. Canary medium may be good, but not so good as the lamp shown by Mr. Cowan a few weeks ago. Most samples of canary medium are faulty, owing to insufficient care in manufacture. In the lantern he found canary medium safer than two ruby glasses, or ruby and orange pot-metal.

Mr. W. COLE: Has Mr. Henderson used canary medium with daylight?

Mr. HENDERSON: Yes; but having oiled it, a wet plate can be easily fogged through it. It is a mistake to oil the paper or make it transparent.

Mr. J. M. TURNBULL (Edinburgh) said the photographers in Edinburgh had given canary medium a trial, but found orange paper answer every purpose.

The following question from the box was read:—"Does the sulphite of soda developer destroy the half-tones to an appreciable extent?"

The CHAIRMAN found it did so.

Mr. COLE said the use of citric acid to neutralize the alkalinity prevents it coming into more general use. If sulphurous acid were used to neutralize, or if the sulphite were employed without neutralizing, it would work very well. In the case of thinly-coated plates, it would be well to leave the sulphite out, as the colour might be beneficial in printing.

Mr. F. W. HART exposed two trial plates from different batches of emulsion, giving a full exposure to compensate for the large quantity of citric acid he added to neutralize an alkaline sample of sulphite of potash; both plates were over-exposed. He then exposed two more, giving each one second, $\frac{1}{10}$. One plate was correctly timed and perfect, the other slightly under-exposed; he could scarcely think citrate had a slowing action.

Mr. TURNBULL found sulphite of soda to vary considerably. Sulphurous acid was the proper acid to neutralize with, in his opinion.

Mr. F. YORK spoke favourably of sulphurous acid for the purpose named. By filtering through marble afterwards, a perfectly neutral solution could be obtained.

Mr. HENDERSON said he had been treating emulsion with dilute sulphuric acid to remove the particles of decomposed gelatine adhering to the sensitive salt. After adding more gelatine and washing, he obtained a slow emulsion, very clear in the shadows. He was now trying the addition of pepsine for the same object—viz., clearing the shadows—and found it did not slow the emulsion.

The CHAIRMAN: Has anyone tried emulsifying with castor oil instead of gelatine? He made a batch, but had not yet seen the developed results. His object in trying castor oil was to be free from decomposed gelatine.

Mr. DEBENHAM asked the Chairman how he obtained a mixture.

The CHAIRMAN replied that he dissolved the salts in distilled water, adding the bromide first and the silver afterwards.

Mr. DEBENHAM should expect to find them floating on the surface; they would not be dissolved.

Mr. W. M. ASHMAN: There it no reason why castor oil should not be employed. If an emulsion can be prepared in a mucilage like gum-arabic, why not in castor oil?

Mr. COWAN: Because one is soluble in water, and the other is not.

Mr. HART: A perfect emulsion of castor oil can be made with gum tragacanth.

Mr. HENDERSON enquired if the Chairman obtained a fine precipitate.

The CHAIRMAN said, as fine as any with gelatine; the formula is as follows:—

Castor oil	... ...	1 ounce
	A	
Silver nitrate	... ...	100 grains
Distilled water	... ...	6 drachms
	B	
Bromide of potassium	... ...	80 grains
Distilled water	... ...	1 ounce

Add B to the oil, then A, boil twenty-five minutes; then add Nelson's No. 1 gelatine, 2 drachms, set, and wash; after washing, add another 2 drachms of gelatine. Make up to 5 ounces in all.

Some doubts being expressed as to the whole of the oil being washed away, it was suggested that a final wash in alcohol would dissolve any remaining traces.

Mr. TURNBULL passed round a modified holder for lantern slides. When the slide is in position it is held by a trigger, which, being released, permits the slide to drop through, similar to the drop shutter.

Mr. HART showed a model of working parts of head-rest, combining every possible movement required.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The next meeting will be held in the Rooms of the Society of Arts, John Street, Adelphi, W.C., on Thursday, March 6th, at eight o'clock, when the adjourned discussion on "Whether pictures upon ready-sensitised paper are more or less likely to be permanent than those on ordinary paper," will be resumed, and Mr. Edward Dunmore will read a paper upon "Old Photographs." Members and friends having "old photographs" (of the method of production of which they can give particulars) will oblige by exhibiting them.

NORTHAMPTON INTERNATIONAL PHOTOGRAPHIC EXHIBITION.—This will open on December 15, 1884, and will remain open until January 10, 1885. *Conditions.*—1. There will be an entrance fee of 5s. to be paid by each exhibitor in competition whose exhibits cover less than twenty square feet, and 10s. to those whose exhibits cover more than twenty square feet. 2. All pictures for exhibition must be sent mounted and framed, with the artist's name, address, and price (if for sale) on the back; the titles of the subjects, and the process by which produced, may be neatly affixed to the front of the pictures. On no consideration will the name or address of the artist be permitted on the front, as such will appear in the catalogue. No pictures in Oxford frames will be admitted. 3. The committee undertake to unpack, re-pack, and return all exhibits remaining unsold; all carriage must be prepaid by the exhibitor. Every care will be taken of the exhibits, but at the same time the committee will not hold themselves liable for any untoward accident that may occur, with the exception of loss by fire, which is specially provided for. 4. The committee will undertake the sale of exhibited pictures (or further copies) at the usual commission of ten per cent. 5. Photographs coloured by hand will be excluded from competition. 6. The hanging committee reserve the right of rejecting any picture. 7. Each exhibitor must fill up form A, and forward it to the Hon. Secretary not later than November 1st. 8. All pictures must be sent carriage paid, to arrive not later than December 1st (form B being sent as a letter of advice), addressed—International Photographic Exhibition, The Guildhall, Northampton. *Prize List.*—Ten silver and sixteen bronze medals (from a die by Wyon) will be placed at the disposal of the jurors for the best and second best pictures in the classes mentioned. The committee will endeavour to secure the services as jurors of an artist of repute, three well-known and leading photographers, and a representative elected by the local photographic society, none of whom will be connected with the locality.

A LANTERN CATASTROPHE.—An explosion, which shook buildings for several hundred yards distant, occurred on Friday night, at Chadderton Town Hall, Oldham. A series of dissolving views were being exhibited, and whilst five hundred children were singing "Shall we gather at the river?" a loud report was heard, accompanied by the smashing of windows, the gas being at the same time extinguished. On the gas being lighted, the magic-lantern apparatus and furniture were found smashed to fragments. Children rushed down the staircase, and the police assisted numbers of them through windows and down ladders. Several were crushed. The explosion is said to have been caused by the gas-bag coming into contact with a flame, or the sudden lifting of the pressure board. The floor of the hall was ripped up, and the room beneath, where the Chadderton Local Board assemble, was wrecked. Mr. Diggle, the photographer who was exhibiting the magic-lantern, was cut about the face, and thrown down by the force of the explosion. The body of one boy who was killed was found on the staircase, he having evidently been suffocated by the pressure of the crowd. An eth-oxygen burner was employed for the lime-light (see our vol. for 1881, p. 94).

IMITATIONS OF COSTLY LEATHER BY PHOTOGRAPHY.—A genuine seal, alligator, boa, or other costly skin is photographed, then printed on sensitive gelatine, the parts not acted on by light dissolved out in water, and a cast or an electrotype plate then made in copper or type metal, as practised in the reproduction of engravings, and then the metal plate and the smooth leather of some domestic animal are passed between rollers under pressure, and the figure on the plate is permanently fixed on the leather by great pressure. These leathers may be stained, coloured, or dyed to any tint desired; but plain black or the colour left by the tannin is generally preferred.—*Scientific American.*

PHOTOGRAPHIC CLUB.—At the next meeting on March 5th, the subject for discussion will be "On the Advantages or Disadvantages of Sulphite of Soda in the Developer."

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. PIPER & CARTER, *"Photographic News" Office, 5, Castle treet, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. PIPER & CARTER, *and crossed "Union Bank, Photographic News Co. Account."*

*** We cannot undertake to return rejected communications.

W. J. A.—The best preparation to use is a weak gelatinous solution: one part of a clear hard gelatine in twenty of water. 2. Immerse the glass plate and the print in the warm gelatinous solution, and establish contact by means of the squeegee.

T. P. B.—We cannot tell you what the firm in question pays, but imagine that from £3 to £4 a week, with a small commission, is the usual thing.

ALFRED KNOTT.—It is very good of you to take the trouble to send us the particulars, of which we have made use. Further information would interest us.

W. COLES.—Our impression is that the blending or graduating was done on the dry background by friction with a stiff brush, and that ordinary coloured chalks, such as can be obtained from any artists' colourman, were used.

A. G. B.—1. It acts readily on glass, and causes an immediate precipitation of salts of lime. 2. The precipitation is prevented. 3. Certainly, unless in very hot weather. 4. No, our experience does not confirm it.

L. W. B.—1. The most satisfactory cement is the elastic rubber-cement, which can be obtained at the carriers' shops. The parts must be well warmed. 2. We have not seen it; try the encaustic paste mentioned in the Formulary.

VALLETTA.—1. A squeegee is a strip of india-rubber mounted between two laths of wood, so that about a quarter of an inch of the rubber projects along the edge. It forms a kind of soft scraper. A similar instrument, but made on a larger scale, is used for clearing mud from pavements. 2. Linen or cotton fabric coated on one side with india-rubber. 3. Probably from any stock dealer. 4. We should prefer the second on your list. 5. Attend the next meeting of the South London Society; it is on Thursday evening next, at the House of the Society of Arts, John Street, Adelphi.

J. HAMPTON.—Brush it over with boiled linseed oil, and allow it to dry.

JAMES WRAYBURY.—Thank you.

C. H.—1. The action will doubtless take place much more rapidly in a damp place than in a dry locality. 2. Very likely; you had better discard it, and use slate. A coat of paint may make it worse.

LITTLE PHOTO.—You have been very successful, but perhaps you might make the contrast between the two sides of the face a trifle more pronounced. Continue to work, by all means.

IOLANTHE.—1. If you have, as you say, a thorough knowledge of the business in all its details, you will act wisely in doing as you propose, and you may reasonably expect to be successful. Business qualifications are, however, quite as important as technical skill, and from your questions we rather doubt whether you have these. 2. We would rather advise you to purchase if you can meet with a favourable opportunity. 3. From one and a-half to two.

A. BARA.—The plate you send is a very curious example of the reversal of the image. The red parts of the picture are positive, and the grey parts are negative. There is no red fog in the ordinary sense of the term. The partial reversal is doubtless due to the use of hyposulphite in the developer.

M. S.—Either your lens does not work to focus, or your plates do not register with the face of the ground-glass. Focus some fine line work accurately on a ground glass, place in the plate-carrier, and then replace this by the focussing screen. If the register is perfect, we will tell you how to test the lens.

W. M. and ENQUIRER.—Next week.

NORMAN MAY.—1. Although one-tenth of a second is a sufficiently short exposure for many street views, cases may arise in which it becomes necessary to reduce the exposure to one-fifth of this; while on the other hand it is often practicable to give a considerably longer exposure. 2. You speak of "this view," but no photograph was enclosed.

G. H. BARTHORPE.—Thank you.

The Photographic News Registry.

Employment Wanted.

Assist. Op., &c. (town only).—C. H. E., 50, London-st., Tottenham-ct.-rd.
Assist., can print, tone, paint enlarg.—Silver, 40, Gower-st., Birmingham.
Assist., cnl. on Morgan's pap.—F. P., 16, Rochester-sq., Camden-rd., N.W.
Assist, retouch heads for publication.—Retoucher, *Photo. News* Office.
Reception Room, as Improver.—X. Y. Z., 5, Jesse-ter., Reading.
Assist. Operator, could manage.—F. B., 2, James-st., Iffley-rd., Oxford.
Reception Room or Shop (Lady).—A.S., 77, City-rd., N.
Operator, wet or dry.—C. O., 25, Duke-st., Bloomsbury.
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Retoucher and Min. Artist.—Miss Lea, 443, Coldharbour-la., Brixton.
Silver Printer and Toner.—F. C. M., 35, Vincent-sq, Westminster.
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Operator, Copyist, clever with children.—C. O., 25, Duke-st., Bloomsbury.
Retoucher, first-class, in London.—Artist, 15, Hastings-st., King's Cross.
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Retoucher, first-class.—P. Marks, 1a, Britannia-st., City-rd., E.C.
Retoucher, work at home.—J. Fisher, 7, Westmoreland-pl., City-rd., E.C.
Shopman, town preferred.—E. D., 17, Brunswick-st., W.C.
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Lady in Rec. Room, or Spot.—C. R., 40, Netherwood-rd., Shepherd's Bush.
Lady as Retoucher (pupil of Arndt).—M. A., *Photo. News* Office.
Lady Spot., Mounter, Recep. Room.—E. G. C., 115, Westbourne Grove, W.
Oper., Print., Toner, Painter Water Colours.—G. L., *Photo. News* Office.
Assist. Operator and Retoucher.—F. E. Baily, 21, Gt. Oxford-st., L'pool.
Artist, well up.—P. Eckhart, 105, Hall-pl., Hall-pk., Paddington.

Employment Offered.

Printer, first-class, to Manage.—Byrne & Co., Richmond, Surrey.
Printer & Toner, dry-plate.—H. Friedmann, The Grove, Stratford, E.
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Operator (dry plate), also Retoucher.—Lauder, Westmoreland-st., Dublin.
Under-Salesman.—Shew & Co., 132, Wardour-st., Oxford-st., W.

THE PHOTOGRAPHIC NEWS.

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LIBRARY

CONTENTS.

RETOUCHING FOR AMATEURS.

SINCE dry plates have placed in the hands of amateur photographers the possibility of turning out fairly successful portraits working in ordinary rooms, those who have taken up the practice of portraiture feel very keenly the disadvantage at which they are placed from their ignorance of the art of retouching, and feel it all the more keenly because it is almost the only point in which they find themselves really quite unable to compete with the professional.

It is unlikely that amateurs should ever actually compete with professionals in that art which, however doubtful a one it may be from an artistic point of view, is certainly a popular one with the public. Still, there is a certain amount of retouching skill which the amateur may easily acquire, and which would be just enough to greatly improve the general style of his portrait work. In fact, the amount of retouching for which the amateur is likely to gain the necessary skill is precisely that amount which will actually improve the photograph from the most severely artistic point of view. He may acquire the skill necessary to remove the blemishes which are due to the photographic plate or process itself.

The blemishes to which we refer are spots due to defects in the plate—spots which may exist on the skin of the subject, but are perceived with much less vividness by the human eye than by the photographic eye ; the increased distinctness of lines and wrinkles ; the too great heaviness of shadows.

We believe that the reason why amateurs seldom acquire the necessary skill to eliminate these defects is because they have not the smallest idea of how to commence work. We shall give a few hints on the matter.

The first attempts may be made without a retouching desk, the negative being held against a window. The position involved by this mode of procedure is by no means a comfortable one, moreover the eyes are excessively strained ; and if the practice of retouching is to be continued, a retouching desk must be used. The form of this piece of apparatus is well known. It consists of a frame for holding the negative at a convenient angle for working on, a mirror or piece of white paper being placed below it to reflect light through it. Such a desk may be purchased, or may be made by a photographer who is somewhat of a mechanician.

Before a negative is retouched, a proof should be taken of it. The next step is to get a surface on which a pencil will work or "bite." The negative should be varnished with a hard varnish. There are sold various mediums which may be applied to the part to be worked on, but we have found none of them to give a result perceptibly better than can be obtained with turpentine. A single drop of this is placed on the part to be retouched—generally the face, if the subject be a portrait—and is quickly spread over it either with the tip of the little finger or with a bit of chamois leather. It is gently rubbed with a circular motion till the part is dry. A pencil will now bite freely. It is said that the film has a "tooth."

An H pencil of good quality will be found about the best to work with. The point must be made exceedingly sharp. This should be done by first sharpening the pencil in the ordinary way with a knife, then by rubbing it to a very fine point on a piece of drawing paper.

We now refer to the print to see what portions it is desirable to modify. We will find first of all, probably, several spots which are too dark. We look for the corresponding transparent spots on the negative. The pencil is brought to bear on one of those, and by a gentle circular motion the spot is caused to disappear. So we do with all irregularities which are due either to defects in the films, or mere irregularities in the colour of the skin of the sitter.

We have now other difficulties to look at. The line which passes from the inner corner of the eye to the cheek is sure to appear more intense in the print than it did in the subject. Very likely the same will apply to lines from the corner of the nose downwards. We must reduce the transparency of these parts on the negative, and also shorten the lines by blending them with the rest of the face. We do this by gentle strokes of the pencil, being in no hurry, but by degrees working the lines partly away.

Lines of age and wrinkles are not difficult to soften : in fact, they are more easily modified than the lines which we have just referred to, but the amateur requires to use great judgment before he touches them. He must bear in mind that whereas the sloping lines just mentioned are seldom other than a disfigurement when very strongly marked, the lines of age frequently give a beauty of their own to a face. As a rule, in the case of really old people, it is inadvisable to modify these lines. It is in the case of people of an uncertain age, especially ladies, that there is necessity for retouching in this particular direction. These lines, barely visible to the eye, frequently come out with startling vividness on the photographic plate. It is only necessary to run the point of a sharp pencil along such lines, when they may be either softened or eliminated altogether, as may be thought desirable. Care must be taken not to tear through the varnish in doing this. If the lines are very strongly marked, and require to be much reduced, it is advisable to use a softer pencil than the H ; an HB, or even a B, will do.

It will generally be found that in the print from an untouched negative, especially when there has been slight under-exposure, there is a somewhat too sudden transition from high light to shadow, whereby there is a loss of roundness in the effect. To slightly improve this defect is about the limit in the way of retouching which the amateur is

likely to reach. He may increase the roundness by making the transition in the negative from opacity to transparency less sudden. This he does by working with the pencil in fine lines round the parts where the transition commences. Great care and some practice are necessary to do this with any success.

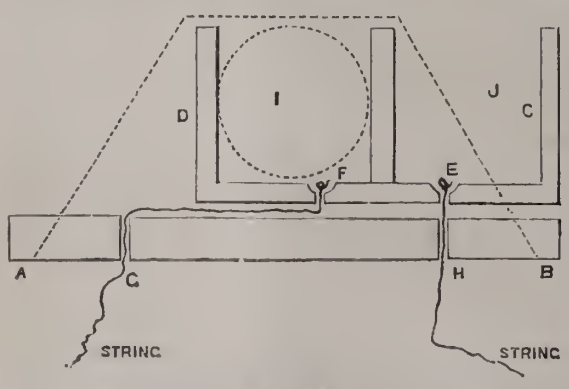
It will be noticed that the defects which are eliminated are only such as appear on the print too dark, and on the negative too transparent. Those which appear too opaque on the negative and too light on the print can only be eliminated by working on each print separately.

The first attempt at retouching may be made on a useless negative, but it is by no means absolutely necessary to use such, as it is easy to wipe out the pencil marks if they are not satisfactory. A drop of turpentine applied as at the beginning will do this.

MR. COWAN'S SLIDE-CARRIER FOR THE LANTERN.

This apparatus, which was shown at a recent meeting of the Photographic Club, enables the lanternist to bring a new slide into the field of the lantern with rapidity and exactness, the transition being almost instantaneous.

It consists of a wooden base-piece, A B, upon which there slides a kind of double frame, D C. A pair of



upright boards, shaped as indicated by the dotted lines, serve to keep the sliding frame in position. The two divisions, I and J, of the sliding double frame, are grooved so as to receive the usual lantern slide (3¼ in. square), and whichever of the divisions stands at the end of the base-piece is first charged with a slide. A steady pull at the string situated at the other extremity, G, brings the slide into position, and the other division can now be charged; after which, a pull at the second string brings the new slide into the field.

The fact of the slide which remains in the outer division of the double frame, being, in great part visible to the manipulator until the moment when it is shot into the field, is an advantage, as there is a considerable probability of any error in placing the slide being noticed before the picture is exhibited.

A TRIP TO THE GREAT SAHARA WITH A CAMERA.

BY A COCKNEY.*

There are only two trains a-day to Batna, and some six hours are necessary for a journey of seventy-five miles. Batna, so the guide-books say, means simply an encampment for the night, and I think the guide-books are quite right. No one in his senses would think of encamping more than a night if he could help it. Before you are half-way there, the country has changed for the worse, and you are in the midst of dry arid plains, with an occasional stretch of water without a blade of grass or green herb beside it. A tropical sun beats down fiercely over the black mud waste, and for miles and miles there is not the shadow of a tree or bush. It might be the great desert itself already, if it were not for the fact that we are amid the mountains, and at an elevation of some 3,000 feet.

The photographer *en voyage* does not now-a-days require to develop his plates as in the old collodion days, but boiling water is sometimes welcome to him, whether as a luxury or a necessity. I always take the means with me to obtain this, whenever there is occasion to rough it, whether the idea is to purify water by boiling, or to make an occasional cup of tea. So I will here mention how I am provided in this respect. A flat sponge spirit-lamp is in my outfit, and a tin flask of spirit. This is not methylated spirit, but pure, so that if any leaks out among your linen there is no disagreeable smell. A little saucepan, with a handle that doubles inwards, I prefer to a kettle, for it takes my tea in a tin-foil package. Moreover, I carry a dozen little cambric bags, the use of which I will explain. When I want a cup of tea, my saucepan (it holds about a pint) is filled with water and made boiling; then as much tea as is necessary is put into one of the bags and immersed in the boiling water. My tea made, I remove the bag and throw it away with the tea leaves. In this way my saucepan is always clean, and will serve immediately afterwards for any other purpose.

Another serviceable thing to carry with you is a few yards of thin waterproofing. Mine weighs but a few ounces per yard. I find this very useful for enveloping my dark slides before putting into the side-pocket ready for use. Dust is everywhere just now, and really the only way to keep it out is by an envelope of this material. Thanks to a simple covering of this, which is also as opaque as brown paper, I have so far kept my slides and plates free from dust and grit.

You are now in *la vraie Afrique*, as the landlord at the Batna auberge has it. Dilapidated tents of dirty fabric mark the encampments of Arabs here and there, very similar, indeed, to our gipsy encampments at home, except that, instead of sorry horses picketed around, there are ragged camels and plump little asses. The blankets or burnouses of these roving Arabs are much more dirty and ragged than those of their town brethren, and altogether they inspire the stranger with less confidence. Jones and I both prefer strolling about inside the Batna walls after sundown, to worrying the Arabs near their encampments.

Some very interesting remains of a Roman city are close to Batna, at a place called Lambèse. The French department of Beaux Arts have spent some seven hundred thousand francs in excavations, and with such success, that a most complete forum has been unearthed, together with a temple with several columns standing, a bath, and a portion of a theatre. There is also a large portion of the Prætorium standing, with the inscription on one of the arches, "Legio tertia Augusta," signifying pretty clearly that it was the work of the third Augustan legion. This brings us somehow within measurable distance of the founders, and Jones says that when he gets home he shall overhaul his Cæsar for an account of it.

A stately Arab in his spotless white toga served as guide, and added, perhaps, to the sentiments of the scene. Before us, stretching over the wild hills for a mile or more, were scattered the relics of a bygone race, the rugged country marked here by a graceful column, there by a pile of massive masonry. You could stand on the broad platform of the forum and harangue the soldiers of the third Augustan legion, in imagination, if not in reality. You could from this spot see in your mind's eye the populace ranged round the theatre, witnessing a drama——— "Eh! what is it?" I cry, for Jones is calling to me, as I stand alone at a solitary spot conjuring up these pleasant fancies. He has to repeat twice before I can hear. "Why, a panther half eat up a dog last night, about here, and

* Continued from page 132.

the village people are out after him to-day," roars Jones.

I am sorry to say the third Augustan legion vanished rapidly after this, and afterwards I keep close to the guide, to hear what he has to say about the Romans. For all that, the romantic fancies do not come back, though the panther does; and whenever I am rather long over focussing underneath the dark cloth my stupid companion reminds me of the panther of Lambèse.

There is a road south from Batna, along which a diligence travels as far as El Kantara, on the confines of the Sahara, but thence to Biskra, the third oasis, there is only a track. The French, however, threaten a railway not only to the Sahara, but for some 200 kilometres into it, so that a few years hence, it may be possible to penetrate the great desert within twenty-four hours of leaving the northern coast. As yet, however, the railway has still to be made, so we book places in a diligence, which is to take us the last stage of our journey, and which leaves Batna at five in the morning.

Out into the moonlight we drive, through a cool crisp air, our little party with the banquette all to ourselves—the banquette, as many of my readers know, answering to the box-seat of a stage-coach, except, as Albert Smith used to say, it is more like sitting under the awning of a bathing machine. By-the-way, Algeria is very much like old-fashioned France, so far as travelling is concerned: you have the auberge, and you have the diligence. There are no hotels worthy of the name in East Algeria; only the auberge is to be found. The cuisine is excellent, the sleeping accommodation tolerable, the conveniences vile. But then you cannot expect all the luxuries of *la vie d'asphalte*, as a Frenchman very happily expressed city life to me the other day, and to a Cockney it is worth while exchanging these occasionally for a bit of nature.

The diligence, with its seven or eight horses, harnessed three on four abreast, is also enjoyable for a time, if you are not relegated to the omnibus portion of the vehicle. Twenty or twenty-four hours is generally sufficient, however, to wear off the novelty, and then you begin to appreciate highly the thoughts of a well-ordered railway carriage.

The country is bare and sterile to a degree, your only thought being as to where the diligence will next find horses in such a wilderness. The human beings you encounter by the wayside are an occasional road-maker (generally a negro of the blackest hue), and now and then some ragged Arabs driving along groups of mangey camels, laden, apparently, with dirty bed mattrasses. The bed-ticking, however, is full of corn; and as the lumbering diligence with its clattering horses, comes rumbling along, the driver cracking his whip right and left, the timid camels, with their snake-like necks and softly-cushioned feet, hurriedly make way, and huddle together by the way-side till the noisy conveyance has gone.

The sun glows hot and red over the rocky ground; and presently a lofty granite ridge, that has hitherto barred the way, appears cleft in twain, leaving a narrow portal that is barely broad enough for the road and torrent that flows beside it. On either hand the towering walls of ruddy rock overhang, and a gorge of vast dimensions shuts in the traveller on all sides. But only for a moment. There is a turn in the road; and then, through the grand red portal, your dust-worn eyes are ravished by the sight of green palm trees and fresh verdure of the most luxuriant growth. This is El Kantara, and the golden gate of the desert—la porte d'or du desert—as it has been most appropriately termed, and these fresh, verdant palm trees, are the first oasis.

I try to retain some idea of the massive rent in the rock upon one of my sensitive plates, but it is a difficult task. I cannot see the top of the rock on the ground glass. I recede fifty paces, tilt my tripod, and use the swing-back of my camera to its utmost. In this way, I manage to get some part of the roadway in the foreground, and obtain a little margin of sky above the lofty range. Then I carry the camera into the gorge itself, picking up, on my way, a stately Arab, who is very anxious for me to look over his collection of papers, but who is not quite so satisfied when I want him to stand away at some distance to break up my foreground. He is a capital guide, he calls out to me from the spot I have put him, and he has received many testimonials from people who have employed him. In the end, I have to look them through; and I find my stately Arab friend has something besides testimonials; he has an English lady's photograph—the lady in a well-fitting Jersey and jaunty Corsair cap—with the lady's name at the back of it. Ah me! no wonder he scorned (although he took it) the half-franc I offered him for posing. The fair lady—she left her address, by-the-bye, with the stately Arab, as well as her name—must have treated him very well, to make him think a sixpence too little for doing nothing for some five minutes or so. I wonder, though, whether, when she so kindly gave her portrait to this coffee-coloured Othello, she ever dreamt he would show it to every passing stranger. And, by the way, I could give her a photograph of him now, if she would accept it.

A native mud village with its characteristic flat roofs in shelter of the oasis is so pleasing that my friend Jones and I go on our way, leaving word for the driver to pick us up as he goes. There is a street of houses all built with those black bricks of dried mud which the Israelites could not make without straw, and this we forthwith bag in the camera. Then there is a market place, with more mud houses, and this, too Joues and I pay our attentions to.

"I wish you had taken that instead," says Joues, pointing to a group of palms just as my drop-shutter has fallen. (Jones is such a fool; he always waits till I have exposed, and then says he wishes I hadn't.) I am rather sharp with him, therefore, when I say, that I don't think his palms are worth a plate. "Don't you? Well, just look how gracefully they rise against the sky line; and look, too, where the desert melts away in the distance. Why, you havn't seen such a—why, what the deuce is that moving over there?" I asked, "Where?" rather sulkily. "Why, there along the road in front of us. Yes, it is—it is the diligence." And off scuttles Jones as hard as he can run, leaving me alone in the desert.

The mud village with its uncanny Arabs are behind me, the desert in front. Despite my difference with Jones, I prefer him to the Arabs, and with one sweep I gather up camera and tripod and all. The sun does not shine, it blazes—Jones has got the umbrellas—but it is a question of must, and 'helter-skelter I go in this heavy marching order over the scorched ground. Jones set up shouting as soon as he started, and by great good fortune a man hanging at the back of the diligence sees him. The machine stops, and in five minutes' time, thank goodness, I am safe and sound once more from hungry lions, dog-eating panthers, and blood-thirsty Arabs. "Yes," says my friend, "it's a good thing I ran off when I did, or you would have been nowhere." This is only his view of affairs, I need scarcely say.

Still onwards over the black parched ground. There is still a low mountain range dividing us from the true Sahara, and before we reach this, another green oasis comes into sight. But I don't get down to take any more photographs. I prefer sitting under the awning of the banquette; it occurs to me that the glaring sunlight may be too bright for photography. At any rate, I want to finish this letter and put it into the post, and I may not be able to do this if I am left behind again.

Now we come upon patches of sand, and now again the ground is covered with white powder as if it had been dredged with flour. I consult the driver, and he says it is saltpetre, and that the French military authorities used at

one time to gather it for gunpowder making. What a pity there is not some rapid nitrate of potash developer known, and then I could get down, and collect some free, gratis, for nothing—but no, thank you, I forgot; no more getting down for me.

More sand, more droves of camels, more dust, and more heat. We have arrived at the foot of the mountain range, and are now slowly climbing the Col de Sfa, as this last pass is termed. The sun is setting, and the rocks are blood red in the ruddy glow. On toil the horses, on, on, till gradually the summit is reached, and we have but ten more kilometres now to our journey's end. The driver gets his horses once more into a trot, and then we emerge upon a terrace-like road, whence the full desert is seen at our feet.

Behold a boundless plain of golden sand, as broad and as far as the sea itself. Nay, the flat horizon is further off than at sea, for here and there are patches of green that supply a middle distance, and seem to carry the eye on, on, into the remote distance. The green patches are palms that form the oasis, but all is on one even level, that recedes to the end of vision. The tints from the setting sun stain the foreground a gorgeous purple, and there is a glitter afar off resembling that of daylight playing upon the ocean. No wonder the jaded French soldiers, as they wearily climbed the Col de Sfa for the first time and came upon this scene, cried out for very joy, "The sea! the sea!" It was like the first step home again.

Another hour's trot through the twilight, and we are under the dark shadows of the Biskra palms. Our diligence pulls up before a colonnade that faces the welcome shade, and white-robed Arabs gather round to see the arrivals. "Hotel Sahara?" calls out my friend Jones, handing down the precious reflector lantern we have safely carried some fifteen hundred miles. "A moi Monsieur," replies a swarthy "blanket," and the instrument is placed safely in his hands.

And what did you see first? Well, it was nearly dark as we walked along the covered colonnade, but on the way to the hotel I peeped through a canvas curtain that hid one of the doorways; it was a café, full of company, and there was a billiard-table and a gentleman with a cigarette in his mouth making a cannon off the red. And as I stood and watched him, there came to me the music of a military band from under the palm trees. So you see, after all, that with billiards and band, and shady palm groves, an oasis in the desert of Sahara is not such a bad place for a Cockney to come to.

THE SPECTROSCOPE AND ITS RELATION TO PHOTOGRAPHY.

BY C. RAY WOODS.

III.—The Spectrum.

We are now in a position to make ourselves acquainted with the spectrum, and to consider a few of the properties of light on which the spectroscope is able to impart information; but it is absolutely necessary, first of all, that we should make ourselves familiar with the different parts of this rainbow-coloured band, before we can properly attempt to define any of the points bearing on the familiar operations of the laboratory and dark-room. It is not needful to study the spectrum too minutely; it will be sufficient to become acquainted with certain defined landmarks by which it will be possible more or less accurately to point to any particular part of the spectrum.

We have some such index in the colours of the spectrum, but that alone is not sufficient. To say that such and such a thing takes place at the blue end, for instance, is vague, and may or may not convey an idea with scientific precision. Nor is that all. All eyes are not the same, and apart from definite colour-blindness, two persons may not gather the same mental impression from looking at a particular part of the spectrum. Again, the condition of the eye is not always the same, for by using the eye to some particular colour for a time, it is easy to produce a partial and temporary colour-blindness, to make the retina less sensitive to certain rays. The reader will see this more clearly, perhaps, by a few illustrations from actual experience with the spectroscope. Ask two observers, for instance, where the green and blue parts of the spectrum appear to blend; they will seldom mark the same place. Again, look with the spectroscope towards a dull part of the sky, then to a bright portion, and lastly to the sun itself. At each change in the intensity of the light, the colours of the spectrum will appear to have shifted their position in reference to the dark solar lines. The change in position may be small, but it will be enough to show how inefficient the sensation of colour is to define accurately any given part of the spectrum. This has been very well put by the Astronomer-Royal for Scotland, who says: "The colours, unfortunately, are not indeed so absolutely constant in spectrum place as are the Fraunhoferic lines; for they (the colours) seem to be endued with certain extents of locomotion in the spectrum according to the brightness of the light at the time, and the state of the eye. But still these ranges of locomotion never change the appearance of a colour from one side of the spectrum to the other, but only produce certain small variations of + or — on the standard colour at, and for, that place."*

The colour sensation caused by a particular ray cannot, therefore, be relied upon to furnish more than a *general* indication of its position; but as a rough guide it is sufficiently useful, and will be frequently used in these pages. To begin with, it would be almost impossible to indicate where and how the reader will recognize the principal Fraunhoferic lines without some such guide. Turn the spectroscope then to a bright portion of the sky, using a magnifier in place of the ground glass if the camera is being used. For the central parts of the spectrum this light will be quite bright enough, and will not tire the eyes; but for the rays in the dark blue and violet, and for the extreme red end, the direct light of the sun may be required. If more convenient, a small mirror or piece of looking-glass may be used to throw the light into the slit of the instrument placed horizontally instead of pointing it to the sun or sky.

The line that can be most unmistakably recognized is the line called D in the yellow. This line is seen really to consist of two when viewed under higher dispersion. Looking from D towards the red, another well-marked dark line is noticed, called C; still lower in the red, and if the instrument is

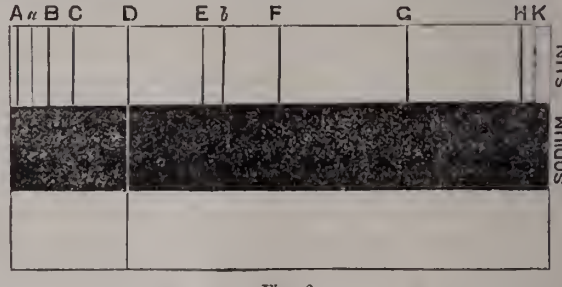


Fig. 6.

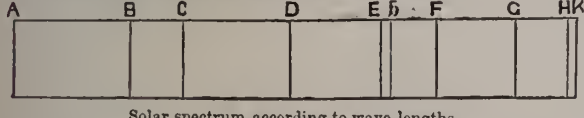
turned only towards the sky almost at the extreme part of the red end of the visible spectrum, is B. If the spectroscope be pointed to the sun, it is possible to see lower still in the spectrum, and A will come into view. Below A the spectrum is, to most people, quite invisible, and some cannot even see so far. Returning to D, and travelling from that line to more refrangible parts of the spectrum, certain definite lines will be seen about the middle of the green. These are E, and just beyond E, the *b* group, "little *b*" as it is called. In a spectroscope of small dispersion "little *b*" appears as one thin and one thick line, the thin

* Piazzi Smyth, "Madeira Spectroscopic."

line being nearest to E. With higher dispersion the thick line is resolved into two. A little beyond the green, just in the blue, is F. G is the centre of a group of dark lines in the violet-blue or indigo. At the extreme end of the violet are the two lines formerly spoken of as H_1 and H_2, but now called H and K. These lines require a strong light, that of sky scarcely being sufficient even when the eye is in a most favourable condition for seeing them. The writer can only see them with difficulty under any circumstances.

Below the red we have invisible rays that give a sensation of heat, and were consequently called *heat rays*; beyond the violet we have rays which the photographer's sensitive plate can receive, and which were called *actinic* or *chemical rays*. These terms never received a great amount of attention from spectroscopists, and need not be mentioned again, for they are now quite obsolete in scientific literature and conversation, the terms *infra-red* and *ultra-violet* having been substituted for them. To call the ultra-violet rays *the* actinic rays is quite absurd, when, as will be shown later on, the maximum reducing effect of the spectrum is with most compounds nearer to G.

The relative positions of the principal Fraunhoferic lines, as shown in an ordinary spectroscope, are not correct, however, the less refrangible end being compressed, compared with the more refrangible end. The effect is much the same as if we attempted to draw a scale on a piece of paper, and made it one inch to the foot at one end, graduating it up to two or three inches to the foot at the other end. Let us represent the lines as they are seen in the diffraction spectrum (to be treated later on), at distances apart proportionate to their wave-lengths. A comparison of the solar spectrum in fig. 6, with that of fig. 7, will show how much the prismatic spectrum is distorted.



Solar spectrum according to wave-lengths.

Fig. 7.

Hitherto we have been considering the solar spectrum; but if we examine the spectrum given by a solid body rendered luminous, such as a white-hot poker, or the particles of carbon in an ordinary gas or lamp flame, we get a spectrum perfectly continuous instead of being crossed with black lines. If we examine the spectrum of an incandescent vapour, we get a spectrum of bright lines on a dark ground. A flame containing sodium vapour, for instance, gives us a bright line in the yellow, which Fraunhofer found to be coincident with the D line of the solar spectrum (No. 2, fig. 6). If the light from a flame coloured with sodium or one of its salts be allowed to pass through sodium vapour at a lower temperature, it is found that the sodium vapour is able to absorb the very light which itself gives forth when incandescent. If the light from a gas flame be examined by the spectroscope after passing through sodium vapour, we get a continuous spectrum crossed by a dark line (No. 3, fig. 6). These facts led Professor Stokes and others to come to the conclusion that sodium existed in or surrounding the sun, and absorbed a certain amount of the light given out by the body of the sun. In 1859 this was brought more prominently forward by Kirchoff and Bunsen, the former of whom was soon able to show that many of the other lines of the solar spectrum were due to different metals. This research was rapidly followed up, and we got to know something of the constitution of not only the sun, but many of the other heavenly bodies.

The examination of the light from different sources soon proved to be a very accurate and delicate means of analysis; sodium, for instance, can be detected in the minute particles of dust floating in the atmosphere. An expert in spectroscopy can readily analyze a substance by examining its light; but in the hands of a novice the very delicacy of the method mars its practical usefulness in the laboratory, for substances can thus be detected, the presence of which cannot be shown by other means.

LESSONS IN OPTICS FOR PHOTOGRAPHERS.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

Lesson X.—*continued.*

Position of the Stop.—The position of the stop in a lens is an important point to which to attend. The best position can be calculated, or can be ascertained readily by trial. Of one evil special care should be taken, viz., that a "flare spot" on the plate arising from an image of diaphragm itself should be avoided. The late Mr. J. H. Dallmeyer first brought this prominently to notice in 1867, and offered an explanation of it through the courtesy of Sir J. Herschel. The origin of the flare spot will be seen from the following diagram, and to illustrate our remarks the simplest

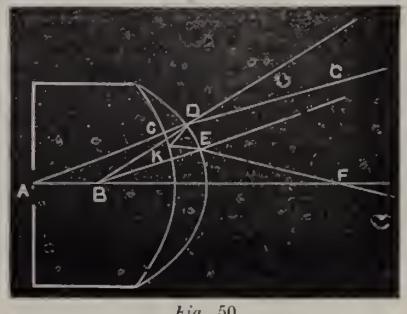


Fig. 50.

case has been taken, which is, where the centre of curvature of the anterior surface coincides with the centre of the diaphragm. Let A be the centre of curvature of the first surface and also the centre of the stop, and B that of the second surface. Then trace the course of a ray from A, such as A C. Since A C is perpendicular to the first surface, it will pass to D without refraction, whence part will be refracted along D G to form the proper image of the object, and part will be reflected back to K, where it will again be reflected to E, part being reflected again, but now of so feeble a character as to be negligible, and the greater part be refracted to F. So that at F we shall have an image of the centre of the stop with more or less distinctness. By treating the other points of the aperture at A in the same manner, it would be found that at F we had an image of A. There being no receiving screen there, the rays would pass to the plate or focussing screen on which the image of the object was received, and form a central spot of flare. The position of the stop is worse the more nearly F coincides with the focus of the image of the object, and for this reason it will be found that by moving the stop nearer to or further from the lens, the flare, though not obliterated, can be made to diffuse equally, or nearly so, over the plate. Our previous lessons will have indicated that greater flatness of field is obtainable by moving the stop further from the lens, the field being more curved as the images at the margin of the plate are formed by "oblique *contral*" rays.

Central flare is also found in double combinations, often in a much more exaggerated form, and is much more difficult to get rid of owing to centres of curvatures of the back combination lying on both sides of the axis, so that whilst by shifting the stop to get rid of one image of the aperture in the diaphragm, an image is called up from the reflections from the other surface. The best plan to get the minimum flare is by trial, shifting the stop till that is found.

Relative Illumination of the Image with Different Stops.—Let *a a* be a small stop, and let parallel rays be projected on the lens, then the brightness of the image will be dependent on the diameter Q R, which is equal to *a a*, and a measure of the illumination to form the image at F is

given by the base of the cone of rays collected at F, *i.e.*, by the area of which Q R is a section. This area may be measured by $(Q\,R)^2$. Similarly, with an aperture $b\,b$, the illumination may be measured by $(P'S)^2$. Hence it may be seen that the brightness of the image formed at F

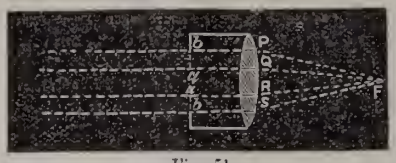


Fig. 51.

of a distant point varies as the square of the diameters of the apertures used. Thus, in one lens a stop of $\frac{1}{4}$-inch diameter will only give an image a quarter as bright as that formed by a stop of $\frac{1}{2}$-inch diameter. In general, if s be the exposure with a stop of diameter a, with a stop of diameter b the exposure will be

$$s\frac{a^2}{b_2}$$

If we wish to compare two lenses together, using different stops, we must carry the reasoning a little further.

To Calculate Exposures with Lenses of Different Focal Lengths, and Different Sizes of Diaphragms (Stops).—Let AB be the lens having a focal length (AC or BC), describe a circle with distance AC, and centre C. It is manifest that the parallel rays proceeding from a distant point to form an image of the point at C only, a small part of the

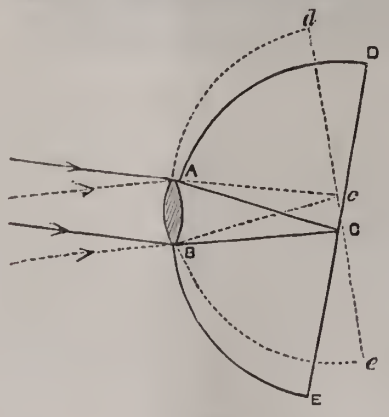


Fig. 52.

theoretically possible rays are collected, viz., those falling on a circle having a diameter AB (fig. 52). The theoretically possible rays would be collected on the surface of a hemisphere DABE. The proportion of rays collected to those theoretically possible is therefore—

$$\frac{\pi(AB)^2}{2\pi(BC)^2} \text{ or } \frac{(AB)^2}{2(BC)^2}.$$

which shows that the illumination varies directly as the square of the aperture of the lens, and inversely as the square of the focal length, or as $(\frac{f}{a})^2$, calling f the focal length, and a the aperture of the lens. If, then, we wish to compare two lenses with different apertures and focal lengths together, all that is requisite is to use the following formula:—

$$\frac{\left(\frac{f_1}{a_1}\right)^2}{\left(\frac{f}{a}\right)^2} \times s = x$$

where s is the exposure with the first lens, and f_1 and a_1 are the focal length and aperture respectively of the second lens, x is the exposure to be calculated.

As an example, suppose it is known that a lens of twelve-inch focal length, and one-quarter of an inch aperture, requires an exposure of ten seconds, what exposure must be given to the same subject with a lens of ten-inch focus, and one-eighth of an inch aperture? The above formula is—

$$\frac{\left(\frac{10}{\frac{1}{8}}\right)^2}{\left(\frac{12}{\frac{1}{4}}\right)^2} \times 10 = x = 28 \text{ seconds nearly}$$

It is manifest, then, that if we know f and a for any lens, we can readily compare it for rapidity with another lens if the same quantities are known. We have here neglected the absorptions due to varying thicknesses and qualities of the glass employed, as also the number of reflecting surfaces; but this is practically immaterial. It may roughly be taken that each reflecting surface diminishes the light by two per cent., but a dirty lens will cut off very much more. We have known as much as twenty-five per cent. to be cut off from this cause.

GENERAL NOTES.

BY COLONEL PLAYFAIR.*

We are concerned more especially with the gelatine process; and if a beginner were to turn over the pages of the journals to know what to do, or if an old hand were to refer to them trying to discover the best process, he would be rather puzzled with the amount and variety he had to deal with. Even in the present day, if the question, "What plates do you use, and how do you treat them?" were to be answered by different people, the person seeking information would have a variety of answers.

A very great deal has been written regarding the gelatine process, but, notwithstanding, what strikes me as being very peculiar, is the small variation between the make and treatment of a gelatine plate in 1873 and one in 1883. Much discussion has been owing, no doubt, to the different material with which writers and experimentalists had been working; for instance, the proportions of an emulsion had been given, and when people came to try it they commonly used their own developer, which, the chances are, was not proportioned as the one used by the person recommending the emulsion, and the same with developers being tried on different styles of plates. The one great advance has been the increase in rapidity, and this advantage chiefly caused the old processes to be laid aside.

In 1873 I dialysed with heat at about 100° for twelve hours; in the present day the heat for emulsification has, in many cases, been increased to boiling point. I have tried most of the processes in their day, the most charming being the collodio-bromide, and if anyone were to produce in the market a rapid plate, I am sure there are many who would return to that process. One which I adopted some years ago was making a collodion with silver dissolved in it. I dipped the silver film in a bromide bath, just as the iodised film is dipped in the silver bath, and, after washing off the superfluous bromide, flowed over a preservative and dried. The want of rapidity, however, stopped me; but since our knowledge of the effect of ammonia in the gelatine process, I have thought rapidity might now be produced by the addition of ammonia to the bromide bath. I have not tried it, but it is possible that something in this direction might be adopted to increase the rapidity.

For a long time the gelatine process caused much trouble and disappointment, owing to frilling, staining, green fog, and ignorance in developing; but, happily, these are things of the past, although many produce green fog by pyro. development. It can be effectually got rid of by Captain Abney's treatment with bromide of iron and ferrous oxalate.

Regarding emulsion-making and plate-coating, I will only remark that when I left off experimenting in this direction I found the "cold emulsifying" of Mr. A. L. Henderson, as well as the "depositing system" of Mr. W. K. Burton, easy, and to give good results. I now use plates from a maker, and am saved a good deal of inconvenience.

As respects development: in the year 1881—the first half especially—a great many articles were written, hardly a number of the journals being issued without an article on or some allusion to the subject. Very little alteration has taken place, however, in the nature of the developer. Formerly it was an

* Abstract of a paper read before the Bristol and West of England Amateur Photographic Association.

object to get the developer from anyone who had done good work; but the application of it to some other person's plates was a test which did not always produce the desired effect.

Experience has taught people now more about what they are using, and the object to be aimed at by altering proportions to suit their requirements, according to light, subject, exposures, &c.; in fact, this has been so generally established, that an article on development is rare in comparison, and certainly it does not call forth a discussion, as on former occasions.

There are many advocates of the ferrous-oxalate developer, and the question as to which is the best developer might be practically tested when the outdoor meetings are held by taking duplicates of a subject, and developing one by pyro., and the other by ferrous oxalate, the negatives being exhibited by the different members. This would be a matter of curiosity, and create some interest. Formerly—in fact, till lately—when a plate was cleared in the hypo. it was considered finished, and properly ought to be. But in cases of miscalculation we now have at command a subsequent treatment, and clearing it from stain, reducing and intensifying are resorted to; in fact, a gelatine negative is now so under control, as to be finished according to the standard of one's own fancy.

To say what is the *best* way of the many to make a gelatine plate and develop it, can only be looked for when it is discovered that one maker's plates are superior in every respect to another. Some approximation, however, might be obtained if medallists could be induced to mention the makers of their plates and their treatment of them—I mean specially as regards laudscapes; but I fear this high road to perfection would detract from the interest of those who take a pleasure in experimenting to overcome difficulties. Even much could be learnt among ourselves if (say) a particular subject in the vicinity were selected, and a competition for the best negative and print were to take place. The effect of different makes of plates and developers would then be apparent. A comparison of results, knowing the details of how they were manipulated, would tend to increase our interest. I think it would give a stimulus to our work, and be productive of the best results.

CAUSE OF FADING IN SILVER PRINTS.

BY ANDREW DUTHIE.*

If unable to actually solve the question, I trust at least to show some reasons for the fading of silver prints. It is usually said that insufficient washing after fixing is the cause of fading; but this I am not prepared to admit, especially when we find unmounted photographs by our best photographers are all liable to the same discolouration as mounted portraits. With those firms who deal largely in scrap photographs, the washing receives special attention. Messrs. Wilson, for example, finish the washing in nearly boiling water. This would ensure the removal of the last trace of hypo.

In 1849, Sir John Herschel recommended dabbing the back and front of the print with a soft sponge. This to be repeated three or four times. He said if the washing was properly carried out, photographers would be troubled no more by fading of prints. Of course the photographs he referred to were on plain paper, such as Whatman's drawing-paper. Nearly all of us, I think, have seen the books of Calotype photographs, exhibited by the secretary at our last conversazione. They seem to bear out Sir John Herschel's statement, for they show no signs of fading that I can see. These are also on un-albumenized paper. This, I think, brings us a point nearer a solution of the difficulty. From what I have heard about prints on plain paper, and some experiments I have been making lately, I am inclined to think fading is, to a great extent, due to the decomposition of the albumen. I mentioned this the other day to a manufacturer of albumenized paper, and was assured that they treated the paper somehow with an acid to prevent decomposition taking place. If I am not mistaken, it is citric acid that is used. This is very likely—indeed, almost sure—to be washed out by the time the print is finished. The albumen is therefore left without any preservative, and is a substance which would very likely succumb to the influence of a damp atmosphere or a hot sun. This seems probable, as we often hear of prints hanging on walls for fifteen or twenty years, and showing little signs of fading. All these years they have been pressed close to the glass of the frame, which is rendered nearly air-tight by being pasted over the back with brown paper. In the old frames, the paper was only put round over the tacks, and this, I think, was more completely air-tight than the present mode of stretching it right across the back.

I regret that the month which has elapsed since I undertook this subject has been too short to allow me to complete my experiments. I trust, however, towards the end of the year to have something to show in support of my opinion about albumen. We shall now consider another cause of fading which is not, I think, generally known. On inquiry I learn that hundreds of tons of hypo are annually used by paper manufacturers; in fact, a friend of mine was told by a member of one of the largest firms that it was impossible to do without hypo. Napoleon the First once said that there was no such thing as an impossibility; still the paper makers seem to find one here.

I mentioned at last meeting some of the results I had got with about sixteen faded cabinet portraits with which I had provided myself. I omitted to state that they were taken by the leading London photographers. They were portraits of celebrities, and had been in our windows exposed to the full blaze of the sun all the afternoon, and to the effects of gas at night. Some were in stock three or four, others twelve months. In every case I found traces of hypo, and in several free sulphuric acids present. Three mounts were analysed; the first contained in an aqueous solution hypo, sulphates, and starch. In an acid solution there were traces of iron and lime, considerable quantity of potash, and a good deal of soda. In this mount there was no excess of acid. In an aqueous solution of the second were found faint traces of hypo sulphates and chloride. In the ash were iron, lime, potash, soda, strontium, and albumina; also a considerable quantity of free sulphuric acid. The last, the only one which resisted all tests, was a black one; it was free from hypo and sulphates, although subjected to more severe tests than any of the others. This one was neutral to test paper. I might also mention that I have tested a number of sample mounts belonging to various London and local dealers; I found they all contained the same impurities, although varying in quantity.

I would like to ask some of those present for their experience of gold bevelled-edge cards. There seems to be something in the colouring matter of the chocolate which is almost fatal to silver prints. The black mounts are the same, though in a less degree. The green alone does not seem to injure the prints. In one case I had a C.D.V. photograph fade so completely that the faces were flat and pale—so much so as to be unfit for use. All this took place in about three weeks; it was mounted on a chocolate card. In conclusion, I may just mention that white and yellow cards appeared to contain most free acid, while those of darker colours were mostly neutral to test paper.

* Read before the Glasgow Photographic Association.

Notes.

The Photographic Studio of the National Library in Paris is now in complete order, and arrangements have been made by which any photographer may make use of it for reproducing the artistic and literary treasures of the institution.

M. Klary, whose name is familiar to our readers as the originator of a new style of illuminating the model, which he brought to this country some years ago, has elaborated another invention which has to do with printing in colours. We are not yet familiar with the details of the process—M. Klary has visited America with a view to its sale—but, as M. Klary is a painter, rather than a photographer, we presume the invention is not another pretension to photograph in natural colours.

The use of hyposulphite in the developer as a means of shortening the exposure has been repeatedly suggested, and several photographers have adopted the method with advantage. Audra, however, now proposes to attain the same end by immersing the gelatino-bromide plate in a

solution containing one part of sodium hyposulphite in 10,000 parts of water, the film being well rinsed before development. The fact of hyposulphite in the developer tending to cause a partial reversal of the image is an objection to its use, and it will be interesting to ascertain whether the same disadvantage attends the new method.

Mr. F. Galton's system of composite portraiture will be fresh in the memory of our readers; a number of portraits being combined so as to form a typical picture or general representation of a class of persons.

The idea of composite representation has been applied by Mr. G. M. Whipple, of Kew Observatory, to the production of average meteorological curves, so that generalisations extending over long periods may be made obvious at a glance.

Let us give an example. The wind velocity as determined at any given station during a day is recorded as a curved line, but abnormal conditions may render this curve an untrue representation of the ordinary diurnal variation of the wind. Mr. Whipple, however, employs photography to superimpose the curves obtained during a stated interval, strikes out entirely abnormal or storm curves, and draws an average curve through the remainder. A number of the average curves may be again averaged, so that a faithful representation of the general diurnal variation is realised.

In the same kind of way averages may be obtained of barograms, thermograms, electrograms, magnetograms, and rain or sunshine curves. The principle is, indeed, capable of a widespread extension to many branches of physical science.

"The terror in London" was the heading of a sensational article in the Madrid paper the other day. The reader was treated to a wonderful account of the terrible events that came to pass at the Victoria and Paddington stations. London, it said, unlike Madrid, had all its stations in the heart of the metropolis, and the consequence was that the reduction to ruins of the principal termini would carry havoc among the Londoners. But one thing we must give Madrid journalism credit for: the idea of photographing the results of the explosion, our Spanish contemporary considered a very happy one, as a ready means of bringing before experts details by which the latter can arrive at the nature of the destruction. Certainly, our authorities are now very learned in the matter of explosions, and it is said that from the photographs alone, the expert can give a very good guess as to whether the disaster has been produced by gas, gunpowder, or any of the nitro-compounds, such as guncotton, dynamite, &c.

An interesting paper was read at the last meeting of the Liverpool Astronomical Society, by Mr. Isaac Roberts, F.R.A.S., who gave an account of his experience in astral photography.

A propos of astral photography, it is noteworthy that in the thirty-eighth report of the Harvard College Observatory, just issued, the subject occupies a prominent position. Professor Pickering is a believer in the value of photography, and operations are systematically carried on. The satellites of Jupiter have occupied much attention photometrically, and by the use of a double image micrometer the time of their occultations and transits have been determined much more accurately than by the old method. Photography has also been largely made use of in the preparation of star maps.

It is not at all unlikely that the tricycle will revive an interest in photography among amateurs. The writer of an article on "The Development of Cycling" in this month's *Longman's Magazine* gives several instances of cyclists who are also photographers, and remarks, "This photographic work is a great feature in tricycling; complete apparatus can be easily carried on a modern machine, and many riders with such an outfit are to be seen gliding along the country lanes with a keen eye for "hits." He adds that a couple of well-known cyclists recently gave their club a very pleasant entertainment with the lantern, the slides being from photographs taken during a journey from London to the Land's End and back.

Photographic portrait clubs appear to offer many facilities for dishonesty. We have recently noticed an instance of this, and last week another case occurred, a canvasser of a London firm being sentenced to six weeks' imprisonment. The *modus operandi* was failing to hand over to the proprietor monies collected from members of the club.

Herr Anschütz's extensive series of military photographs, on exhibition at the Kriegsakademie in Berlin, are spoken of enthusiastically by the Prussian staff. Most of the pictures are cabinets; but excellent enlargements are shown. Men and horses were secured during the most rapid evolutions, and the sharpness of detail and perfection of the deepest shadows is said to be surprising.

We quite agree in Mr. Alfred Dawson's opinion that the most pleasing aspect of the Shakespeare bust in Stratford Church is a three-quarter face view. It is simply because draughtsmen and photographers have hitherto been in the habit of showing the effigy full-face, that so many find fault with it. Any one looking at such pictures must have been struck by the dull, pork-butcher-like aspect of the bard, whereas, seen from a three-quarter point of view, there is much more character. The new Shakespeare Society are going to have a photo-gravure prepared, and Mr. Dawson has been selected to do the photography. We are glad to find, therefore, that a mechanical full-face view is not to be selected this time.

Many people there are who hold the opinion that a photograph is never more than a photograph. They say: "Now I don't want any nonsense, but pray set up your camera in front of this object, and let me have a copy of it."

Fortunately, this class of people is easily satisfied; they know there is nothing in photography, and if you give them a bad picture, they are none the less contented, since it bears out their pet view of the soulless nature of the art. Yet, as in the instance of Mr. Dawson, so in ninety cases out of every hundred, the qualified photographer, if permitted to exercise his taste and judgment, may do a great deal; for the aspect of an object from a certain point of view, or the lighting of it from a certain quarter, let alone skilled development, often makes all the difference in the world between a good picture and a bad one. Both are photographs and represent good technical work, yet they are as different as carbonate of lime is to caseine.

A somewhat novel adaptation of the Boycotting system has been started by Messrs. Melander, photographers, of Chicago. They have discovered that the taking of portraits by amateurs has worked "positive injury" to their business, and they have therefore "decided not to buy over stock of any house dealing in these amateur outfits." A communication containing this awful threat was sent to the Chicago Amateur Photographic Club, which, we are glad to say, did not seem much disturbed by it. One of the members, however, admitted that the ladies of his family were not willing to allow him to make their portraits, and that he willingly sent them to the professional photographer. It is to be hoped this confession will bring joy to the hearts of Messrs. Melander.

The Chicago Amateur Photographic Club, by the way, has a pleasant free-and-easy method of conducting its proceedings. At a recent meeting the Secretary announced that he had not the minutes of the previous meeting with him, but, if desired, would read the report of the proceedings as published in a local newspaper. Imagine the thrill of horror which would run through the Photographic Society if the Secretary gravely proposed to put before it, as the minutes, the report published in the PHOTOGRAPHIC NEWS!

Photographers engaged in the production of studies often put the cart before the horse; that is to say, they usually choose their model first, and then think about the expression or rôle he or she is to assume afterwards. Now, in nine cases out of ten, the painter does not evolve the idea of a picture out of his own brain, but has it suggested to him by his observant eyes. Mr. Robinson told us the other day how his "Merry Tale" was suggested to him by seeing a group of ladies chatting in the drawing-room; and the same holds good with Rejlander's charming studies. The latter would see in the streets or elsewhere a model that suggested a picture to him, and, artist-like, he never rested till that model was secured.

The photographer but too frequently does the reverse. A lady of his acquaintance is elegant and good-looking, and being convenient to his hand, he sits her down before the camera, and tries what he can make out of her. Her auburn hair is let down, she has a sheaf of straw put into one hand, and a sickle in the other, and she is bade look like Ceres. But the result too often is that the hair in the picture looks as if it had been "let down" for the occasion, while the model simply appears as a lady half through her toilet. Had you met a model promiscuously, and been struck with her appearance, how her face was that of a Ceres or a Diana, or a Madonna, or what not, the chances are when she was posed and draped in accordance with your idea, she would still further please you. Better, then, let studies be suggested by the eye rather than the brain.

Patent Intelligence.

Applications for Provisional Protection.

4014. RICHARD WHITE, of 315, Essex Road, Islington, in the county of Middlesex, for "An improvement in apparatus for oxyhydrogen or lime-lighting."—Dated 27th February, 1884.

4119. GEORGE WILSON, of 4, Hope Street, Withington, Manchester, in the county of Lancaster, photographer, for "An improved photographer's lamp."—Dated 29th February, 1884.

4144. WILLIAM BLAIR ANDERSON, of 26, Union Terrace, Aberdeen, in the county of Aberdeen, Scotland, photographer, for "Improvements in colouring photographic prints."—Dated 29th February, 1884.

4258. LOUIS BURGOYNE PILLIN, of 16, Thornsett Road, Anerley, in the county of Surrey, dental surgeon, for "A photographic camera clip-support."—Dated 3rd March, 1884.

Specifications Published during the Week.

416. G. D. MACDOUGALD, "Improvements in apparatus for storing and conveying developing and other chemicals required for the production of photographic pictures."

This invention consists essentially in the storing of photographic chemicals in the ordinary sealed tubes of the laboratory, having the usual projecting ends, or in sealed tubes, somewhat resembling those used for chloride of gold, but having indentations for ease in breaking. The inventor also claims certain kinds of paper or other packages for the storing of chemicals, together with flexible capsules such as those used for storing medicines. We quote a few words: "These envelopes may be made with a material soluble in water, or with a material insoluble in water, and provided with a seam of gum-arabic or other soluble or adhesive substance, which opens by the action of water." Divisions in the packages enable the photographer to store several chemicals in one package. We regret that we cannot find space for the full text of the patent, as it is the first photographic patent published under the new law; but we may mention that the claims embody the use of paper boxes having lids which will open when the box is immersed in water; also the storing of chemicals in porous materials, such as the blotting-paper used in connection with the so-called magic photographs. As far as we can gather, a photographer taking a measured quantity of a dry chemical into the field in a paper box or package would not be liable to pay a royalty to Mr. Macdougald if he adopted the ordiuary plan of opening the package, and emptying the solid into his developer; but if he were to tie the box or package to the end of a stick, aud stir it about in the developer until the package gave way, he would have to pay a royalty. It also appears to us that any person tying a bulb of chloride of gold to a rod for convenience of breaking it would infringe this patent.

3362. FRANK WIRTH, of the firm of Wirth and Company, Patent Solicitors, at Frankfort-on-the-Main, in the Empire of Germany. "An improved method of producing plates by photography, to be used for printing purposes." [A communication from the firm of Benecke and Fischer, of St. Louis, United States of America, and JOHN FRANK, a person resident at Frankfort-on-the-Main, in the Empire of Germany. (*Provisional protection only*).

This invention relates to an improved method of producing photo-lithographic plates for use in printing. The object of this invention is to produce a plate from which a picture or the like can be printed, the shades of which are formed by a number of points or dots placed more or less close together, the design for the picture being engraved upon a zinc or other plate, from

which impressions may be taken by pressure. The productiou of the design is accomplished by taking by photography from a negative a small representation of the object which is to be reproduced. This representatiou is enlarged, whereby a design is produced which consists of a great number of small points or dots, and which is thus in a suitable form to be engraved upon a zinc or other plate in order to be reproduced by pressure.

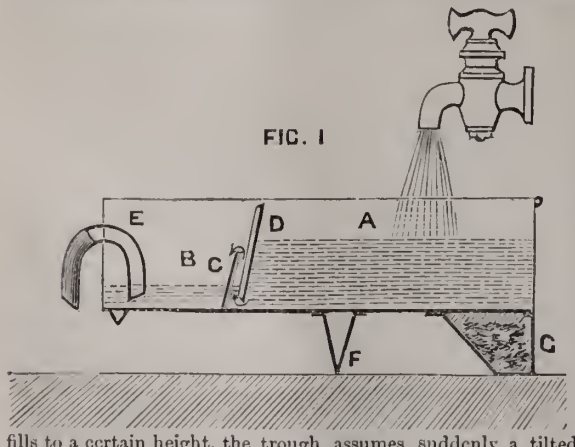
3476. Richard Brown, Robert William Barnes, and Joseph Bell, all of Liverpool, in the county of Lancaster, for "Improvements in meaus for and methods of producing designs upon paper or other fibrous or soft material, or upon metallic surfaces."

Our present invention relates more especially to improvements on inventions for which Her Majesty's Royal Letters Patent were granted to Walter Bentley Woodbury, dated July 22nd, A.D. 1878, and numbered 2912, for "Improvements in means for and methods of producing designs upon paper, cloth, or other fibrous or soft material," and dated September 19th, A.D. 1879, and numbered 3760, for "Improvements in means for and methods of producing designs upon metallic surfaces" respectively; the specifications of which Letters Patent described methods of producing designs upon the surface of paper, cloth, or other fibrous or soft material, or upon flat metallic surfaces, by means of similar designs first obtained in relief by the action of light upon sheets of gelatine or gelatinous material rendered sensitive to light in the way well understood and practised.

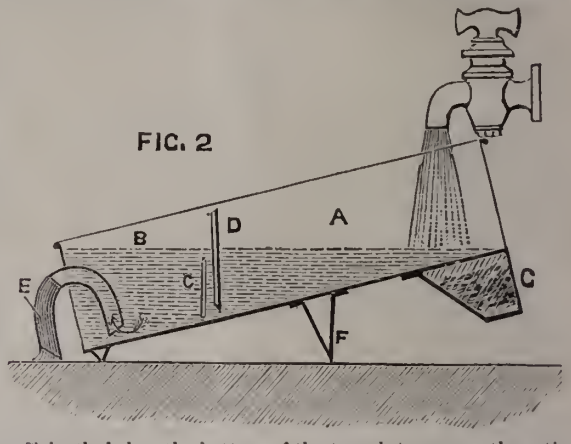
Claims.—The method of preserving from obliteration designs produced upon paper by pressure, by treating them with a waterproof solution, substantially as described. Also, the methods of producing metal relief surfaces substantially in the manner and for the purposes described (production of metal replicas of the relief). Also, the method of preparing and using metal relief surfaces for impressing designs upon sheet metal such as tinfoil, where it is desired that some parts of such metal shall be left bright, and others dead or "mat," substantially as herein described.

712. F. Hazeldine, "Improved apparatus for use in washing photogtaphic prints and other articles or materials."

The trough is divided into two compartments, of which the first or washing compartment receives a constant stream of water that flows from the one compartment to the other, whilst the second compartment is provided with an outlet syphon or valve. The trough is so balanced that when the second compartment



fills to a certain height, the trough assumes suddenly a tilted position, thereby violently agitating the water among the prints or materials being washed, separating them, and starting the syphon or opening the valve. The arrangement is such, that the outflow shall gain on the inflow, so that the water will be run off from the second compartment faster than it flows into the first, until, the second compartment having been almost emptied, the counterpoise preponderates and returns the trough to its horizontal position again, agitating the water, &c., whereupon the trough refills and the same operation is repeated. Figure 1 is a longitudinal section of the trough in its normal position, and figure 2 is a similar section showing the trough in its tilted positiou. The same letters of refercuce indicate the same parts in both the figures. A and B are the two compartments of the trough separated by a partition C, which rises from the bottom to within a certain distance of the top of the trough. The compartment A is the larger of the two, and in it are placed the prints or substances to be washed. D is another partition dipping into compartment A at a short distance from partition C, and reaching from the top of the trough to within a short distance of the bottom, so as to compel the water at the lower part holding in solution the salts washed out (and which, being of greater specific gravity, sink to the bottom of the trough) to pass out through the space between the two partitions C D iuto compartment B. E is a syphon of which the short leg dips into compartment B and reaches within a very short distance of the bottom, whilst the bend of the syphon is sufficiently below the top of the trough to ensure the syphon being started automatically when the trough assumes the inclined position figure 2. The longer leg of the syphon extends



sufficiently below the bottom of the trough to ensure the action of the syphon continuiug until the compartment B is sufficiently emptied. The trough oscillates on a transverse fulcrum formed by a downwardly projecting rib or plate F fixed or hinged to and extending across the bottom of the trough, and in its normal position (fig. 1) the trough rests partly on the fulcrum F, and partly on a downwardly projecting part G at the end opposite to the syphon, which part G is sufficiently loaded to preponderate and to bring the trough back to its horizontal position when the compartment B is nearly empty, but is overcome when the compartment B fills up to about the top of the partition C; the relative position of the partition C and of the fulcrum F being such as to enable this action to take place by the alternate preponderance of the weight G and the full chamber B. The compartment A receives a constant supply of water so regulated that the inflow is somewhat less than the outflow through the syphon E.

CHAPTERS ON LANDSCAPE AND OUT-DOOR PHOTOGRAPHY.

BY H. P. ROBINSON.

No. 9.—Old Clo'.

The student should never omit to pick up quaint and picturesque bits of costume whenever he has the opportunity of doing so. Aladdin's enemy, the African magician, offered new lamps in exchange for old; the modern magician, who evolves pictures by another kind of magic, may do worse than follow the example of his African brother. I am sometimes tempted to trade in the same, apparently, insane manner, and give a new frock in barter for a weather-stained old garment not intrinsically worth tenpence. It is curiously difficult to meet with anything that is strikingly picturesque and suitable in the way of costumes, and still more difficult to secure it. The wearers at first think you are making fun of them, and end by thinking there is something more in it than meets the eye, and that they ought to have made a better bargain. It took an artist friend of mine some hours and a long journey to buy a navvy's waistcoat. The garment is a perfect treasure to a painter, but not of so much use to a photographer, for its virtue lies in colour. It was originally a blue velveteen, but had become worn and weather-

stained into a lovely harmony in blue and green. My friend was coming on a visit to me at Tunbridge Wells, and saw the possessor of the wonderful waistcoat on the platform at Charing Cross Station. He followed him into a "third-class smoking," got into conversation, plied him with tobacco, and after a lot of diplomatic talk, offered to buy the coveted garment. The thing was not worth eighteen-pence, but my friend offered seven-and-six. The navvy thought he had met a fool or a millionaire, or perhaps both in one, and refused to sell at any price. Tunbridge Wells station was reached, and the bargain not concluded. The painter ought to have got out here, but the waistcoat was too tempting, and he went on to Hastings with the navvy, where he at last managed to arrange a deal.

An artist, who built himself a "lordly pleasure house" in the country, gave every old woman—and young one, too—in the parish a red cloak, that the spots of bright colour should add a charm to the landscape. Not knowing their origin, I once tried to buy one of these cloaks, and then I learnt the mystery that had puzzled as well as pleased me. The village was not entirely inhabited by descendants of Red Riding Hood, neither had the fashion of that particular cloak descended from generation to generation, like the tall Welsh hat, which descends as an heir-loom from mother to daughter in the Principality. It was a happy thought: but there was one defect—the cloaks were all alike in cut and colour; there was no variety. Now, what the student should aim at in the collection of a rustic wardrobe for photographic purposes is not only picturesqueness, but variety. It is more difficult than would be supposed to get what might be called prosaically a "change of clothes" for your models. And if you have collected a great variety, you have a predilection for certain dresses and effects, and they insist upon coming in like the much-quoted King Charles's head in Mr. Dick's "Memorial." I am painfully conscious that I fail in this way as much as anybody. There is a particular way of arranging one of the articles of rustic dress I so often practise that my artist-friends call it my trade-mark. I do not mean to point out what it is more particularly, for I don't want to make it more conspicuous, and I am sure I shall want to use it again.

The dresses need not be the unsophisticated bits of drapery they appear to be in the finished picture. There is no reason in the world why a white apron or handkerchief should be absolutely white in the original, when they would give nothing like so pleasing an effect, and photograph much worse than if they had been dipped in a weak solution of coffee or "Judson." In addition to dresses, cloaks, aprons, handkerchiefs, and the like, great variety of effect can be got out of hats and bonnets. There are marvellously picturesque shapes in straw to be picked up for a few pence; those introduced a few years ago, called, I think, Zulu hats, sold at about twopence each, added a new beauty to rustic life. But it is the sun-bonnet that is most characteristic of the country. This is made in every variety of shape and colour. Sometimes a light one is useful to come out as a light spot against a dark background; sometimes a bit of dark is required to contrast with a brilliant light.

In dressing your figures, let there be no mistake; your figures must be so like the real thing that only the initiated shall discover the difference. Fancy dresses won't do. Corydon and Phyllis fresh from a costume ball may be very well as china ornaments, or on the stage, but they would be out of place in an English landscape. Shepherds and shepherdesses with pet lambs and crooks, and aristocratic milkmaids, belonged to a time when art and literature were in their most debased and artificial state, and should never be revived except in burlesque. I am the more particular in insisting on this because I cannot help noticing that when attempts are made to make the kind of pictures I have been writing about, there is usually a dressed-up look about the figures. This is not the fault of the art, but of the artist.

Besides dresses, and all that belongs to dress, a collection of accessories should be got together, such as baskets, jugs, sticks, hay-rakes, and the numerous little things that are to be met with in country life likely to give a motive for a picture.

If sea-pictures are your object, it is always well to have accessories, such as shrimping-nets, lobster pots, &c., of your own; you are then independent, and it is not always possible to borrow at just the time you most want them. When people are busy they cannot always, however willing, lend the tools they are working with. If you go into a hayfield to make pictures, weather, wind, light, and all that goes to make a picture, may be right, but haymaking while the sun shines is a thing about which, proverbially, it is dangerous to have any delay, and the haymakers may be too busy to attend to you or lend you their implements; if you take your own models and everything they require, you will be able to take time over your pictures, and may expect good results.

There is another aspect of the costume question which may be referred to here. Scenes and incidents of country life seem to be better adapted to the requirements of the photographer than any other kind of subject, especially if he should intend to make a point of his figures. There are, however, subjects sometimes attempted that seem quite unsuitable to the art. We are bound to recognize ordinary facts, and should keep within the possible. An anacreonism should never be allowed. The photographer should accept the limitations to which his art confines him, and only represent those scenes and subjects which could exist in the nature of his own day. To dress a figure in the costume of past times, and to call the photograph of it by the name of some historical person, is to commit an anacreonism. In painting it is different. Although the painter uses a model, he does not give you, or pretend to give you, an exact portrait of his model. You do not think of how it is done when you look at the painting, but you can scarcely escape the feeling that a photograph is the absolute reproduction of some scene or person that has appeared before the camera. I have seen a photograph, for instance, entitled "Sir Roger de Coverley." We all know that it is not the Sir Roger of the *Spectator*, but a portrait of Mr. Blank dressed more or less like the real old country gentleman. There would have been no objection to calling this picture "Mr. Blank as Sir Roger de Coverley." In the early part of my photographic career, I was as much a sinner in this way as anybody. I didn't know better. I did not hesitate to call my little efforts by the names of people who had died a thousand years before photography was thought of, or who never had any existence at all. Ophelia, Elaine, Mariana, the Lady of Shallott—these were some of the names I profaned. I soon found out my mistake. I am not one of those who pretend not to read or take heed of criticisms, and have often felt obliged to the critics for many a hint. The following from a notice of the Exhibition, 1859, in a morning paper, is what opened my eyes on this subject. It is curious to read, after so many years, that my first success was as popular as a nigger melody—although not a dozen were sold, and it only appeared at two London Exhibitions.

"We do not say that a great many new photographs have not been collected, but simply that there are far too many old ones. Why, for instance, are we to be followed everywhere by the eternal 'Fading Away,' which is fast becoming as great a torment as a popular nigger melody, or any other fashionable street tune? If Mr. Robinson wished to give the public some specimens of his supposed skill in treating dramatic and poetic subjects, surely he could have thought of some novel scenes. We are not sure that Mr. Robinson's figure of 'Mariana' is not new, but we are quite certain that it will not suggest to anyone the 'Mariana' of Tennyson. It is simply the portrait of a young lady trying to look like 'Mariana,' and not succeeding. Cholopouin, a Russian photographer, has

sent, among other things, a figure of 'Mdlle. Orecchia as Leonora,' in the 'Trovotore,' which is satisfactory in all respects. If Mr. Robinson had been the producer of this photograph, he would, in accordance with his system, have entitled it simply 'Leonora.'"

I accepted the critic's hint at once, and have never since given any of my figures the names of historical personages. But the particular is not the general, and I see no objection to the use of well-known names, such as Clarissa or Rosalind, for a picture, so that it is not intended that the picture should represent any particular persons, such, for instance, as the Clarissa of Richardson, or the Rosalind of Shakespeare.

PHOTOGRAPHY AS THE WORK OF RADIATION.

BY CAPTAIN ABNEY, R.E., F.R.S.

The first of a series of six lectures on the above was delivered by Captain Abney, on Saturday last, March 1st, at the Royal Institution.

At the commencement of this subject, said the lecturer, it would be necessary to consider the nature of those minute portions of matter called atoms and molecules. These are too small to be seen, although there are good theoretical reasons to believe in their existence; indeed, it was absolutely necessary to assume their existence in order to account for many of the phenomena to which he would have to draw their attention.

After giving the calculations of Sir William Thompson as to their probable size, Captain Abney proceeded to explain the theory of the chemical affinity of atoms and molecules, illustrating his remarks by various experiments. Silver and antimony were thrown into chlorine gas, the former giving out only a dull red glow, and the latter combining with considerable energy, shown by the brilliant light produced. A number of small magnets were placed in a trough of water, and took up definite positions with regard to one another, unstable combinations being broken up on the application of an external force, stable combinations being then formed. This experiment, being thrown on the screen by means of the horizontal lantern, was very effective.

Applying these experiments to his subject, the lecturer then proceeded to show that in photography one had to consider the arrangement of particles produced by energy in the form first of radiation, and secondly chemical force. Chloride of silver, for instance, was blackened by sunlight, or by the radiation from the electric arc, but it was necessary for some substance to be present capable of absorbing the chlorine thrown off. Tubes of chloride and bromide of silver were shown, which would not blacken in the light, they having been made perfectly dry, and sealed up in a vacuum. Other examples were given of re-arrangement of molecules by chemical force and by radiation, in the action of chloride of copper on silver, and the combination of hydrogen with chlorine. The latter refused to take place in red light, but on the red glass being removed from before the lantern, a loud explosion ensued.

In further illustration, a number of printing processes were shown, beginning with the blackening of silver chloride paper, going on to the iron and uranium processes, and ending with platinotype and carbon printing, excellent examples being produced before the audience. In these processes the action of light—or, in other words, the work of radiation—was to re-arrange the molecules of the substances acted upon, forming new compounds, which possessed new properties, and gave rise to different chemical re-actions.

One of the difficulties met with in trying to explain the change produced by radiation on certain compounds is the great range of the spectrum that acts upon them. This the lecturer endeavoured to explain in a very ingenious manner, suggesting that the vibrations of the molecules might not be the same throughout their amplitude, showing, by way of illustration, the swing of a pendulum formed by a weight attached to a piece of elastic.

TARTARIC ACID *VERSUS* SUGAR IN THE DEVELOPER.

BY S. BOTTONE.

All who have had any experience in developing gelatino-bromide plates with the ferrous oxalate developer must have noticed with regret how quickly the solution loses its efficacy, apart from the deterioration which takes place during the development of each picture. This is owing to the avidity with which ferrous oxalate absorbs oxygen from the atmosphere, and to the fact that the resulting persalt (ferric oxalate) is not only incapable of developing a picture, but is actually a powerful restrainer. Mons. Audra's receipt, in which tartaric acid, in the proportion of about 1-30th of the ferrous salt, is added to the developer, gives certainly very surprising results. As might be expected, the acid acts as a restrainer, hence the development proceeds more slowly; but it does not prevent the evolution of the slightest detail even in the deepest shadows, so that no real loss is incurred, except in point of time.

But this is counterbalanced by several advantages. In the first place, the development is more thoroughly under control; secondly, the colour of the deposit is better, and the negative is of better printing quality; thirdly, there is little or no tendency to veil or fog. These are real and tangible advantages; but another of considerable importance follows the addition of tartaric acid—and that is, that the developer does not absorb oxygen from the atmosphere so quickly as before, and, when exposed to sunlight, recovers in great part its power of reduction. It would appear that the ferric salt which is formed during the action of the development is reduced to the ferrous state by the action of sunlight, aided by the tartaric acid. This peculiar reducing action of tartaric acid is not unknown in other cases,—*e.g.*, the formation of silver mirror by reduction of a silver salt in presence of a tartrate. Sugar also possesses this reducing power to a considerable extent, and is known to prevent the oxidation of iron salts, some of the ferrous preparation of the British Pharmacopeia, such as sgr., ferr. iod., owing their keeping qualities almost entirely to the sugar they contain. A saccharine developer for collodion pictures has been greatly extolled by Mr. Carey Lea, and I would now call the attention of my readers to the excellent qualities, both for keeping and developing, possessed by a solution made up according to the following recipe:—

A.—Ferrous sulphate	...	1 part by weight	
Distilled water ...	...	2 parts	,,
Loaf sugar ...		1-10th part	,,
B.—Potassic oxalate (neutral)		1 part	,,
Distilled water ...	...	2 parts	,,

To be mixed as required in the proportion of 1 part by measure of A, to 3 parts of B.

After having developed what pictures are required, the remainder of the mixed solution should be poured into a stock bottle, filled almost to the stopper, and kept carefully closed. Under these circumstances the mixed solution can be used again and again, until the ferrous salt is almost all exhausted. The colour of the deposit given by this solution is quite equal to that of the tartaric acid solution; being dense and creamy, the negative is never thin and poor, unless excessively over-exposed, while the gradation in detail is perfect.

Correspondence.

OPTICS FOR PHOTOGRAPHERS.

Dear Sir,—I am reluctant to trouble you again. Yet if I do not, I may be supposed quite to agree with Captain Abney's lesson in your issue of October 26th, and this I am unable to do; but I will confine myself as closely as I can to the actual issue.

"Distortion as caused by the curvature and thickness of a lens" differs more from "distortion as the effect produced by the refraction of a lens on the axis of excentrical pencils," in conception and treatment, than in reality; for refraction includes both curvature and thickness. But it appears to imply that distortion is due rather to variations in the amount of refraction (such as aberration and thickness) than to the refraction itself. Now the specially

distinctive characteristic of distortion in photographic lenses is, that the whole refraction is the whole distortion. For the desired condition is, that the relative directions of the various pencils passing through the stop should be the same as though there were no lens at all. It differs thus very materially from the ordinarily desired condition of accurate refraction; either to produce a distinct image, or correct amplification as in eye-pieces, for which the excentrical refraction of axes is necessary. Here it is unnecessary, and so we want to compensate the whole refraction, or to reduce it as much as possible. Thus negative aberration, or any effect of thickness which reduces the angle of deviation, is a clear advantage (as regards distortion) in a single lens; and is so easily corrected in an ordinary combination where the lenses are nearly or quite symmetrical, that its theory need never be considered in practice, it appearing to the workman simply as defective correction to be remedied in adjusting the stop—much as Professor Potter remarks concerning achromatic object lenses of large angular aperture, that "in practice these corrections (for thickness) would appear to the working optician as defective achromatism, and would be easily remedied by changing the curvature of one of the surfaces (Optics, vol. 2, p. 159). Fortunately, too, the most favourable conditions for reducing astigmatism, &c., in doublets or single lenses, are also the most favourable for reducing distortion. For both purposes the stop must be always on the plane or concave sides of plano-convex or meniscus lenses respectively. It is therefore with surprise that I see in Captain Abney's illustrations (figs. 36 and 37) that the stop is placed on the convex side of a plano-convex lens. A photographer who did that in practice would be sufficiently disgusted with the result. And especially when we consider how unexpectedly various errors disappear, or change in sign, with a correctly placed stop; it does not seem clear how a theoretical investigation, under these artificially false conditions, will tend to forward Captain Abney's desire to give practical instruction in "Optics" to photographers.

I venture to think it is better, and also more accurate, simply to say that a stop before a lens gives barrel-shaped distortion, because the axes of pencils, forming a pencil diverging from the stop, have this divergence reduced by the converging power of the lens; and that a stop behind the lens gives cushion-shaped distortion, because the axes of pencils, converging in direction from the various parts of an object, have such convergence increased by the same refractive power. And if we inscribe these familiar diagrams within circles, representing lenses, we see at once how the greater distortion corresponds to the greater refraction towards their margins. Variations in the amount of refraction, of course, follow from, and will be found pretty closely to agree with, the aberrations of such pencils. When the stop is properly placed, they are always small, and with meniscus lenses generally negative; though, when placed as in Captain Abney's diagrams, they are very large. Under practical circumstances, too, the thickness (t) sinks to its ordinary small and negligible value.

The special conditions of photographic distortion would appear not to have been present to Captain Abney's mind, as he apparently considers the injurious effect of thickness as equal to the difference between the course of the ray as actually refracted, and that in which it would have been refracted had the distances from the axis of the incident and emergent rays been equal; but such a condition is not required for this investigation, though convenient for calculating the correction for thickness to be applied to the curves for an achromatic and aplanatic object-lens. Thus, in fig. 38, the deviation of an oblique ray required for equal distances from the axis of the incident and emergent ray is not really a desideratum. In this figure, C K does not really measure the effect of thickness on distortion, that effect being measured by the angle contained between C D, and what C D would have been had the emergence taken place at K, and having but a very slight and quite negligible effect on the total refraction; * which total refraction is the distortion, measured by the angle contained between C D and A B produced, A B being the natural direction the ray would have had but for the lens.

I should have been glad to conclude by recognizing some of the instances in which Captain Abney has so justly called attention to, and condemned, some very prevalent errors, but space will not permit. As, however, I hinted a doubt about his explanation of "Aplanatic lenses" when incomplete, I wish to say now that I entirely agree with it.—I am, dear sir, yours truly,

W. H. Wheeler.

P.S.—Since writing the above, two more Lessons have appeared and I should like to have the pleasure of calling special attention to that explaining diffraction, as I believe it is the first popular rendering of its main theorem. Those who desire data for calculation, may be reminded that the components of a double star 1″ apart require five inches for separation, while 5″ may be seen with one inch only.

GREEN FOG.

Sir,—A very singular fact in connection with green fog in gelatine plates came under my notice a few days since, which, being quite beyond my comprehension, I will, with your permission, briefly describe in the Photographic News, as it may, perhaps, tend to throw some light on this strange phenomenon.

I was asked, on going into a professional friend's studio, to look at some negatives that he had lately taken on some plates of his own make, and developed with alkaline pyro. I at once said, "Well, there is certainly plenty of green about them." "Yes," said he, "but look at the portion about the middle, on which the plate rested on the pneumatic holder while they were being coated." And lo! *not a sign* of green fog *there*. Now, why was this the case? Will some of my more experienced brother photographers kindly explain it?—I am, yours, &c., Henry B. Hare.

TRANSPARENCIES ON GELATINO-BROMIDE PLATES.

Dear Sir,—I notice in your report of the London and Provincial Photographic Association, referring to the lantern slides shown by me, an inaccuracy in the formula for developing, which, I think, should not pass uncorrected.

The developer I used was made from a formula by Mr. B. J. Edwards, which I think has been published, and which is as follows:—

No. 1.	
Oxalate potash	4 ounces
Chloride ammonia	40 grains
Water	20 ounces
No. 2.	
Sulphate of iron	4 drachms
Citric acid	2 „
Water	20 ounces

To develop, take equal proportions of No. 1 and No. 2 for a black tone, and for a red tone I use 60 minims of bromide of potassium to each ounce of developer, 160 grains to one ounce water, and by using various quantities of restrainer, any intermediate colour can be obtained.

The above refers to bromide plates the formula for which appeared some weeks ago (p. 79). J. B. B. Wellington.

* It will be observed that the angle of emergence, either at C or at K, is so little inclined to the normal at either point, that the actual refraction would be very small, and the little difference between that at the two normals would tend to unite two rays emerging at C and at K respectively, at some point probably not far from the image. But one must not press an illustrative diagram too closely, for slips will occur between author and engraver, and the text indeed suggests this.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 28th ult., Mr. W. H. Prestwich in the chair.

Mr. A. Cowan showed an improved carrier for lantern slides, in which two slides may be supported in grooves on a travelling platform, and drawn past the condenser by means of strings, attached at each end below the platform.

Mr. W. E. Debenham: It meets the objection raised at the last meeting, as it permits the slides being passed either way.

Mr. Cowan had experimented further with orange paper and green glass, and found with three thicknesses of orange paper and one of green glass, or with five thicknesses of orange paper without any green, there was no effect; he therefore concluded that a red medium is not needed; the point of advantage in using green glass is to obtain a colder light.

Mr. A. L. Henderson exhibited a coating lamp, designed to keep emulsion fluid and emit sufficient light for coating; a floating oil lamp, resting on gimbals, permits the lamp being held in a convenient position for pouring. The front of the lamp was glazed with ruby glass.

The following from the question-box was read: "Why are large heads not taken direct in the camera?" The opinion of the meeting is requested thereon.

Mr. J. Traill Taylor said he should be happy to introduce the subject; but as Messrs. Darker had promised to entertain them this evening, and many visitors were present, he thought such an important question would take too long to discuss. It was ultimately arranged that Mr. Debenham should treat the subject in his coming lecturette.

The Chairman then requested Messrs. Darker to proceed.

Messrs. C. and F. Darker, who were warmly received, took up the greater part of the evening in showing the action of doubly refractive bodies in polarized light. By means of a lantern polariscope a great number of objects were projected on the screen. Commencing with the formation of crystals (benzoic acid), over a dozen different forms of crystallization were shown. Next, by means of convergent light, the rings surrounding the optic axis of crystals, both uni-axial and bi-axial systems were exhibited. These were followed by the different applications of quartz, compound wedges, &c. Next, the effect of unannealed glass was shown, and also compression and expansion of glass, colour appearing directly the molecules were disturbed. Rock sections and organic preparations were also exhibited; also three magnificent mica designs, kindly lent by Mr. Lewis Wright, the wonderful changes of colour in these being much admired.

Messrs. Darker then explained the effect of superposition and circularly-polarized light, showing some very curious effects, especially with a concave selenite plate and a mica sector superposed. But, perhaps, one of the most interesting exhibits was the transparency of salicine crystals photographed with ordinary light, and the same crystals photographed with polarized light, and specially prepared for this occasion by Mr. G. Smith. Some photographs of glass, both with and without presure, were also very instructive.

A large number of selenite designs concluded the proceedings.

Mr. Debenham was sure all felt very much indebted to Messrs. Darker for their kindness in bringing instruments of the highest class to demonstate a subject of so much scientific interest. He never remembered attending any meeting of such scientific value as this had proved, and concluded by moving a vote of thanks to Mssrs. Darker.

Mr. Haddon seconded, and it was passed *nem. con.*

Messrs. J. Cadett, C. W. Coe, and H. C. White were elected members of the Association, and Mr. W. Turnbull (Edinbargh) was elected an honarary member.

Thursday, March 13th, Mr. T. Bolas, F.C.S., will deliver a lecturette on "Phototype Printing."

Amateur Photographic Association.

A council meeting of this Society was held February 28th, at 12, York Place, Portman Square, Lieut.-Gen. the Right Hon. the Lord de Ros in the chair.

The minutes of the last meeting having been read and confirmed, the following members were elected:—Major-Gen. C. F. Arbuckle, R.A., Sir W. T. Thompson, C.B., Lieut.-Col. S. Micholl, Messrs. P. H. Emerson, B.A., M.R.C.S., H. R. Moiser, F.G.S., W. H. Sedgewick, E. G. Burls, L. F. Reichling, W. D. James, T. H. R. Salmon, H. E. White, M.A., F. C. Borckhardt, J. T. Black, R. G. Bellringer, and C. A. Gilder.

The Secretary then laid before the meeting the following prizes which had been awarded at the annual meeting:—Mr. R. Leventhorpe, the first prize, an oil painting in frame, by Carl Frisch; Mr. S. Norman, a silver goblet; Mr. W. S. Hobson, a silver goblet; Mr. R. O. Milne, a water colour drawing in frame; Mrs. Abbott, an oil painting in frame, by J. W. Waterhouse; Mr. W. Muller, a silver goblet; Mr. G. Western, a silver goblet; Mr. W. Adcock, a water colour drawing in frame; Mr. P. Gunyon, a water colour drawing in frame; Mr. T. Brownrigg, a landscape album; Mr. F. S. Schwabe, a portrait album; and Mr. G. Brook, Jun., a portrait album.

These prizes were approved, and the Secretary was directed to deliver them to the members to whom they had been accorded.

A vote of thanks to the Chairman was passed, having been proposed by Mr. Glaisher, and seconded by Captain Lewis.

Glasgow Photographic Association.

The ninth general meeting of the Association was held in the Religious Institution Rooms on Thursday, the 21st February.

Mr. John Parker (vice-president) occupied the chair.

The minutes of last meeting having been read and approved of,

The Chairman called upon Mr. Andrew Duthie to re-open the discussion on "The Cause of Fading in Silver Prints" (see page 151), which was left unfinished at the last meeting.

An interesting discussion followed, and the meeting terminated with a vote of thanks to Mr. Duthie and the Chairman.

Bristol and West of England Amateur Photographic Association.

The ordinary monthly meeting was held as usual at the Studio, Kingsdown, on Wednesday, 23rd January, Colonel Playfair in the chair.

The minutes of the previous meeting having been confirmed, the following gentlemen were elected as ordinary members of the Association:—Mr. Geo. Pearson, Mr. M. Walsh, and Mr. J. Mansell.

The weather was exceedingly unpropitious, the attendance small, and the meeting broke up at an early hour.

Another ordinary monthly meeting of this Association was held at the Studio, Portland Street, on Wednesday, the 27th ult. Colonel Playfair (vice-president) in the chair.

The minutes of the previous meeting having been read and confirmed,

The Honorary Secretary proposed Mr. Edward Walsh as an ordinary member, and he was unanimously elected.

The Chairman then read his paper "General Notes" (see page 150)

Mr. E. Brightman remarked that Mr. Bennett, in the early days of gelatine, did much to popularise the use of gelatine by the introduction of his rapid plates.

The Chairman said that although they were practically using the same plates now as in 1873, still the modification of the formulæ, the additional aids to development in the direction of reducing or increasing density, and the increased experience gained, had placed them in a vastly-advanced position, and given them a control over the results which were in the early days eagerly sought for.

Mr. Phillips inquired if it were generally considered a *sine quâ non* to use the developer recommended by the maker of the plates being used.

Mr. Daniel replied that such was undoubtedly the case, as the maker, if a reliable one, would have experimented and found what developer gave the best results with his plates. Of course, the particular mode of using the developer preferred by the operator might ultimately be adopted, the quantities suggested by the maker being brought to bear upon the operation of making up the developer.

Mr. Brightman expressed his belief in the absolute necessity for different plates being differently treated.

Mr. Daniel, in support of Mr. Brightman, remarked that for weakening his own plates he found dilute cyanide of potassium acted admirably, and was perfectly under control, and yet, when trying it with commercial plates, some were not affected at all by it, while in others the picture was most rapidly destroyed.

Mr. Phillips suggested that one would hardly follow the maker's advice so far as not using sulphite of soda, when so many found it a great assistance. One maker recommended its not being used.

Mr. Brightman stated that, although he did not mean that it *always* caused "green fog," still sulphite of soda did so undoubtedly with some makes of plates, and he was so convinced of this in the case of some plates he had used, that when developing a batch not long since, he cut plates in half before development, and dodged the other plates about, using sulphite of soda with some and not with others, and found most conclusively that in the case of those developed with that salt "green fog" was most apparent to a greater or less degree.

The Chairman recommended the treatment of the sulphite of soda as recommended by Mr. T. Furnell, and which he had found a perfect preventive of evil results.

Mr. Phillips asked if anyone present had experienced the extraordinary opalescent appearance which was seen on the surface of a negative during development sometimes, appearing like the top of a river where a freshly-tarred barge has passed along.

Mr. Daniel said he had often seen it, and found that the effect on the film was to "tan" it and to make it very horny. He had discovered it more often when a plate had had ammonia and pyro. added somewhat largely during development, and had been immersed therein for a rather long period.

After some further discussion, a vote of thanks was unanimously accorded to Colonel Playfair for his interesting paper, after which the meeting was adjourned till the 26th March.

Lochee Photographic Club.

On the 29th of February this Club held their first annual exhibition and conversatione in the Victoria Hall. The walls were hung with a very great variety of specimens of the work of the members, including portraits from the ordinary "carte" to the "life size" picture, many of them being splendid specimens of the art, both for minute accuracy of likeness and artistic pose and finish. The landscapes were a numerous and very fine collection, and attracted much attention. Photographs of public and other buildings were also pretty numerous, and were of a high standard of excellence. Altogether the exhibition, both for extent, variety, and genuine worth, was surprisingly good, and was very tangible and sufficient evidence that the members of the Lochee Club are able and painstaking enthusiasts in the art. There was a large and select company of ladies and gentlemen present. Bailie Ogilvie, the president of the Club, presided.

During the evening various of the photographs were shown by means of the magic lantern, and were much admired. A select programme of music was gone through by several accomplished amateurs, and a dramatic sketch, entitled "Photographers in a Fix," was performed by members of the Club.

Liverpool Amateur Photographic Association.

The ordinary meeting of this Association was held at the Free Library, on Thursday, the 28th ult, Dr. Kenyon, President, in the chair.

The minutes of the January meeting were read and confirmed, and Messrs. Sharp and Swinton were elected members of the Association.

The Hon. Secretary read a letter from the Hon. Secretary of the Sheffield Photographic Society, thanking the Liverpool Amateur Photographic Association for their contributions to the recent Sheffield photographic exhibition.

The Chairman read an addition to bye-law No. 5, which had been made by the Council—"That all prints for competition, or for the exhibitions of the Society, should be mounted on separate mounts, not less than 17½ by 13½ inches."

Mr. H. Rutter exhibited some of the cathedral-tinted glass recently brought to the notice of photographers by Mr. W. E. Debenham.

Mr. J. A. Forrest said that this glass, on submission to the test of the spectroscope, proved to be most unsafe for transmitting light to the developing room. If good pictures were obtained where it was in use it was the result of the merest accident.

Mr. J. H. Day passed round a beautiful transparency which had been developed in a room lit by a naked gas flame, and yet without a trace of fog.

Mr. Rutter differed from Mr. Forrest entirely, and thought that plates might be safely developed where the light passed through glass of the kind described. In practice, however, he preferred to use a sheet of orange paper in addition.

Mr. W. H. Kirkby said that, in his opinion, no glass whatever was absolutely safe for the development of exceedingly sensitive bromide-of-silver films; but he thought that the safest combination was that of light ruby glass and a sheet of orange.

The Chairman thanked Mr. Rutter for exhibiting his specimens of the glass in question, and also for introducing the subject. He (the Chairman) proceeded to say that discretion was necessary in the use of light, and when this was employed almost any mode of illumination might be used in the dark room without danger. He then called the attention of the members present to some extremely beautiful snow pictures, by Mr. Valentine, of Dundee, which he had been good enough to send for exhibition.

Mr. W. Rogers exhibited and described one of Steinheil's new lenses.

Mr. Morris showed some ferns artistically arranged on mounts for photographing.

Mr. J. H. T. Ellerbeck exhibited a number of light and portable frames, invented and constructed by himself, for the display of mounted photographs. These frames were filled with a large collection of prints by Mr. Ellerbeck, as well as with the productions of the Rev. H. J. Palmer, Messrs. Crowe, Forrest, Kirkby, and other members of the Association.

The presentation print of "Chartres," enlarged by the Woodburytype Company from a negative by the Rev. H. J. Palmer, was on view, and also a fine enlargement by Messrs. Goodall and Steven, on enamelled gelatino-bromide paper of Mr. W. H. Kirkby's picture "Tired."

An exceedingly interesting comparison of the brilliancy of the discs given by lanterns by different makers then took place. The Rev. H. J. Palmer showed Mr. Medland's pentaphane; Hughes' pamphengos was exhibited by Mr. Watts; Archer's photinus, by Mr. Phillips; and the triplexicon, by Mr. Knott. This latter is a new four-wick lantern, with a reflector of a special curvature invented by Mr. Archer.

The Rev. H. J. Palmer called attention to a feature in the pentaphane, by which enlarged negatives could be taken direct from an ordinary photographic print.

The members then adjourned to the lecture hall to enjoy a large number of views shown by Mr. Knott with the oxyhydrogen lantern. The transparencies were the work of the Revs. H. J. Palmer and Scott, and of Messrs. Beer, Day, Ellerbeck, Kirkby, Maycock, Watts, and others. Mr. Ellerbeck's series of views among the Hartz mountains and on the Rhine and Latin were much enjoyed; and his comic pictures illustrating Longfellow's poem "Excelsior," which was read by the Hon. Secretary as the pictures passed in succession over the screen, caused much amusement.

Coventry and Midland Photographic Society.

The ordinary monthly meeting was held at the Coventry Dispensary, Mr. Vice-President J. M. Danks in the chair.

After the usual business the Chairman called upon V.-P. Arthur Seymour to read his paper on "Old Dry-plate Processes."

Mr. Seymour said he began photography about the year 1858 by the successful dry-plate process of Fothergill, which was first introduced on the 18th May in that year. He then went on to speak of the troubles of a beginner, &c., and gave a description of the process. A strong neutral silver bath, an old collodion, a careful washing, and extreme cleanliness seemed to be the chief points upon which success depended. The developer he used was the pyro-acetic with the addition of a few drops of a weak solution of nitrate of silver. The exposure in a fair light was from two to three minutes, and Mr. Seymour spoke feelingly of the by-gone pleasure of seeing the image grow under the developer, a pleasure which is lost in the newer gelatine process. He also showed some negatives taken on oxymel plates, and some on Dr. Hill Norris's meta-gelatine plates, which were much admired.

A vote of thanks was unanimously passed.

The Secretary then asked the acceptance by the members of a box each of Mr. S. J. Lloyd's new mountant, whose qualities for sticking, keeping, &c., were known by several of the members to be excellent. He also handed round some German sensitized paper for trial.

After a general discussion, Mr. H. Mountsfort said he could recommend chloride of iron for reducing over-printed proofs, to be used after toning and fixing.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will be held on Tuesday next, March 11th, at 8 p.m., at the Gallery, 5A, Pall Mall East, when a paper,

"Illumination of the Dark Room," will be read by Captain Abney, R.E., F.R.S.

THE POLYTECHNIC PHOTOGRAPHIC CLUB.—The meetings are held at the Polytechnic Institution on the second Saturday and the fourth Saturday of each month, at 7·30 p.m. About twenty members are now enrolled. President, Mr. E. Howard Farmer; Vice-president, Mr. G. E. Davies; Curator and Librarian, Mr. B. Foulkes Winks; Secretary, Mr. T. J. Ayling.

PHOTOGRAPHIC CLUB.—At the next meeting, on March 12th, the subject for discussion will be "On Dark-Room Illumination."

To Correspondents.

*** We cannot undertake to return rejected communications.

F. E.—The following is an outline of the process. An emulsion is made of—

Plain collodion	1 ounce
Nitrate of uranium	30 grains
Anhydrous bromide of calcium ...	7 grains
Nitrate of silver...	13 ,,

The nitrate uranium and the bromide calcium should be dissolved in the collodion, after which the silver should be dissolved by boiling in two drachms of alcohol, and this solution must be gradually added to the collodion, the whole being well agitated after each addition. When the material is coated with them, expose in the camera without drying, and develop with an alkaline pyro developer.

SOUTH DEVON.—You must indeed have a high estimate of our powers if you suppose that we can tell you all about the lenses without either seeing them or having some description; but the front combination of an ordinary portrait lens can be used as a view lens by mounting it in the place of the back combination, and in a reversed position—that is to say, with the convex side towards the sensitive plate.

J. P. GOSS.—1. There are many patents for colouring photographs, and there are also methods of printing colours in succession from several negatives; but no process for producing photographs in natural colours exists at the present time. A little handbook of "Photochromie," published by Liesegang, of Dusseldorf, may give you some useful ideas. 2. The artist you name has a studio in London, and we believe you are right in your conjectures.

WM. BARRETT.—Certain qualities of gelatine appear to have a special tendency to produce films with spots of the kind you refer to, but the reason is not known with certainty. A prolonged agitation of the gelatinous solution tends to lessen the evil, but you had better try another sample of gelatine.

A. B.—You should obtain Burton's "A B C of Photography," published at our office.

WILLIAM MILLER.—In most cases you would find the larger lens the better for the purpose, but much depends on the class of subjects you deal with.

W. H. S.—Thank you; we will bear it in mind.

MILO. ZNEW.—1. You would find the chloride of calcium a very mischievous companion, as it would be hardly possible to prevent traces reaching your plates. Wrap each packet of plates in several thicknesses of tin or lead foil. 2. Yes, perfectly well; but it is not desirable to use very hard water. 3. All the ordinary solutions used in dry plate work should keep well in them, excepting the ammonia; we should, however, prefer glass bottles. 4. No, but you can get some idea of the power of the light by noting how long it takes to impress a standard tint upon a piece of sensitive paper. Write again if you want further information.

W. J. W. S.—They should certainly be protected by a glass.

H. GOMALL.—It seems to us as if the plates had been exposed to light by accident. Try one out of the unopened package, and if that is wrong, communicate with the manufacturer.

C. G.—1. Remove the back combination, and replace it by the front lens, the convex side next the sensitive plate. 2. It is most likely that a notable improvement would result. Make the experiment.

J. O.—1. Use a fine-pointed pencil—not too hard. 2. Yes, only you must take care that the film is thoroughly dry before you apply it. 3. We imagine that you have been considerably over-exposing. 4. Yes. 5. It prevents the decomposition of the pyrogallic acid. 6. All you can judge by is an inspection, and it is not always easy to see clearly. 7. Abney's "Instruction." 8. Yes. 9. It is better to purchase it in the solid state.

DR. F. STOLZE.—We are much obliged to you for calling our attention to the matter, and we will allude to it next week.

ANTIPODEAN.—Such full details on the subject would fill several numbers of the NEWS, and our London subscribers would hardly approve of this.

W. M.—1. Either Nelson's X opaque or Heinrich's answers very well. 2. Any temperature between 140° and 150° will be suitable. 3. If they are acid, and you wish to make them neutral, add a minute trace of ammonia.

ENQUIRER.—See Mr. Campbell Swinton's paper on page 105 of our last volume. See also page 611 and 740.

CHAS. G. WILLIAMS.—You will find an excellent process described on page 402 of our volume for 1883.

TYRO.—No, but you will find an account of Ive's process in the YEAR-BOOK, also in the volume referred to page 498. 2. Our publishers have neither the set of numbers containing the articles, nor the complete volume, but no doubt you could obtain the volume by advertising for it. 4. Yes, but not for some months.

MORE LIGHT.—We think it is due to the mount, but should recommend you to make the experiments described in our leader of the week before last (page 113).

SHAH JEHAN.—I. The expression which you query, and that which you put forward as a correction, mean precisely the same thing, as the large figure multiplies all following it until a sign occurs. In other words, the brackets are not required. 2. In this case the end figure is superfluous. It should be 2Na Br, or 2(Na Br).

G. F. WEBBER, JR.—1. They will answer very well if you treat them as directed for the ordinary albumen prints. 2. You can make the enlargement in a whole plate camera. Compress the paper between glass plates.

The Photographic News Registry.

Employment Wanted.

Printer, generally useful.—F. Foy, 7, Market-st., Deal.
Finishing Enlargements at home.—L. E., Spring House, Merton, S.W.
Operator, land., portrait., menoch, crayons.—W. D., Shaw-rd., Dudley.
Reception Room, Shop, Mount, finish, &c.—B. A.. *Photo. News* Office.
Col. & Ret. (Lady).—E. McCowen, 20, Grand Parade, St. Leonard's-o-Sea.
Retoucher, Operator, Printer.—V. C. Yealett, 3, Queen-sq., Bath.
Manager, exp.—Photographer, Adelaide-rd., St. Pancras, Chichester.
Operator, Copyist, clever with children.—C. O., 25, Duke-st., Bloomsbury.
Retoucher, first-class, in London.—Artist, 15, Hastings-st., King's Cross.
Printer, can speak French.—G. P., 45, Stamford-st., Blackfriars-rd., S.E.
Retoucher, first-class.—P. Marks, 1A, Britannia-st., City-rd., E.C.
Retoucher, work at home.—J. Fisher, 7, Westmoreland-pl., City-rd., E.C.
Shopman, town preferred.—E. D., 17, Brunswick-st., W.C.
Operator & Retoucher.—Light, 94, D Street, Queen's-pk., N.W.
Architectural or Engin. Photo.—W. S., 32½, Colebrooke-row, Islington.
Assist. Printer, good Vignetter.—G. E. C., *Photo. News* Office.
Lady in Rec. Room, or Spot.—C. R., 40, Netherwood-rd., Shepherd's Bush.
Lady as Retoucher (pupil of Arndt).—M. A., *Photo. News* Office.
Lady Spot., Mounter, Recep. Room.—E. G. C., 115, Westbourne Grove, W.
Oper., Print., Toner, Painter Water Colours.—G. L., *Photo. News* Office.
Assist. Operator and Retoucher.—F. E. Baily, 21, Gt. Oxford-st., L'pool.
Artist, well up.—P. Eckhart, 105, Hall-pl., Hall-pk., Paddington.
Artist or Manager.—B. E. P., 91, Kingston-rd., Small Heath, Birmingham.
Silver or Managing Printer.—F. C. M., 35, Vincent-sq., S.W.
Operator and Retoucher (German).—G. Haupt, 181, Aldersgate-st., E.C.
Operator and Retoucher.—J. Brown, 29, Pond-pl., South Kensington.
Youth, as Improver.—M. A., 289, Portobello-rd., North Kensington.
Reception Room (experienced).—B. C., 72, Azenby-sq., Peckham.
Artist, oil, water, monochrome.—F. G., 3, Kenyon-ter., Clapham.
Assistant Operator (Lady).—F. S., 58, Belsize-rd., South Hampstead.
Operator and Retoucher.—Celt, 19, Kingsgate-rd., N.W.

Employment Offered.

Retoucher, clever.—John Hawke, George-st., Plymouth.
Assist. Oper., first-class Retouch.—Disderi & Co., 4, Brook-st., Hanover-sq.
Out-door dry-plate Operator.—R. Ward & Co., 166, Piccadilly.
Sil. Print. & Ton.—Mrs. Harborne, 300, Victoria-rd., Aston, Birmingham.
English Lady for France (shop).—E. E. Y., 24, Mark-la., E.C.
Out-door Operator, Monochrome, Retouch.—A. K., *Photo. News* Office.
Operator, generally useful.—A. H., 68, Fullerton-rd., Wandsworth.
Operator, first-class, for City firm.—J. B., *Photo. News* Office.
Assist. Printer, good Vignet.—J. Ruckmann, 5, Watfield-rd., Ealing Dean.
Operator for Ireland,—D. W., c/o Marion and Co, Soho-sq
Artist, for black-and-white.—G. N., 118, High-st., Notting Hill.
Printer and Toner, first-class.—Cobb and Son, Wellington-st., Woolwich.
Printer and Toner, to manage.—Vander Weyde, 182, Regent-st., W.
Collotype Printer, Woodburytype, &c.—X. X., 38, Poultry, E.C.
Artist, skilful, at 50/- per week.—Winter, Derby.
Printer and Vignetter.—Dickinson's, 114, New Bond-st.
Photographer on Wood.—Photo, 58, Salcott-rd., Wandsworth Common.
Pinter & Toner, generally useful.—Hallier, Stafford-rd., Walsall.
Assistant Operator, first-class.—Byrne & Co., Richmond, Surrey.
Floater.—Tavistock Alb. Wks, 1, Tavistock-pl., Harrow-rd., Kensal Green.
Lady Correspondent and Shop.—West and Son, Eagle House, Gosport.
Operator for Ireland.—D. W., c/o Marion and Co., Soho-sq.
Operator in Horsham.—S. Bayfield, 10, High-st., Notting-hill-gate.
Retoucher, to finish enlargements.—Whitlock, New-st., Birmingham.
Young Man, good all round.—Beta, *Western Express*, Bideford, Devon.
Printer (male or female) for Bristol.—Holden, 23, Queen-st., Plymouth.
Carbon or Lambertype Photo.—W. B. Woodbury, Manor-rd., S. Norwood.
Printer and Toner for country.—Bunyard, 36, Mildmay-st., Mildmay-pk.
Carbon Enlarger and Printer, piece work.—A. D. C., *Photo. News* Office.
Operator and Printer.—Apply, 60, Clarence-rd., Hackney.
Operator (dry plate), also Retoucher.—Lauder, Westmoreland-st., Dublin.
Under-Salesman.—Shew & Co., 132, Wardour-st., Oxford-st., W.
Silver Printer and Toner.—Turner and Kellick, 17, Upper-st., Islington, N.
Camera Makers.—Cussons & Co, 79, Bold-st., Liverpool.
Operator for Ireland, £1 4s. weekly.—D. W., c/o Marion & Co., Soho-sq.
Assistant Operator, dry plates.—Manager, 22, Bishop's-rd., W.
Operator for out-door, retouch, &c.—G., c/o F. W. Hart, 8, Kingsland-green.
Operator, quick & experienced.—H. T. Reed, 16, Tottenham-court-road.
Lady Printers, £1 weekly.—Stuart Bros., 47, Brompton-rd., S.W.
Operator & Retoucher.—Mr. Phillips, 304, Regent-st., W.
Lady for office and to spot.—Mr. Phillips, 304, Regent-st., W.
Assistant Operator for dry plates.—A. W., 62, Gt. Portland-st., W.
Operator, to take charge.—Cobb & Son, Wellington-st., Woolwich.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

SMALL WORK ON OPAL GLASS, AND A NEW PRINTING FRAME FOR THE SAME.

IT is generally admitted, as a photographic axiom, that a matt surface, either on opal glass or paper designed for enlargements, affords facilities for a far more artistic effect than can be obtained when the surface is glossy; still, it is quite possible to overlook too much the value of bright opal glass properly treated for giving to miniature pictures a special charm. The fine delicate stipple in water-colour work which is out of place on a four-inch head, is the making of a little face that scarcely measures half an inch in length. So the grainless surface which gives a painfully definitive sharpness to an enlargement at the expense of softness, is by no means unsuited to a small half-length vignette when the whole picture does not measure more than two or three inches at most.

We have before us a few samples of this class of work, and propose to describe the method by which such portraits are produced; a process which has the advantage of being both simple and easy to work, and inexpensive, at the same time calculated to please a large majority of critics.

Ordinary pot opal is the base of operations, of course selected as free from flaws and scratches as possible. Slight markings may often be rendered harmless by using a substratum of gelatine dissolved in acetic acid and diluted with alcohol. This, when made with one grain of chrome alum to each dram of gelatine, answers well; can be dried off by heat in a few minutes; and should leave no trace of the smell of acetic acid, but present a smooth clean glassy surface. There is little chance of frilling when this is employed.

Ordinary gelatino-chloride might be employed for the purpose we have in view, but the pretty variety of colour obtainable by development being only visible by transmitted light, we are shut up to the two or three modifications of grey for our finished picture. We therefore prefer to print out the picture on a suitable emulsion (plain or vignetted), and tone it any colour possible with an ordinary silver print, the difference being that in this case there is no paper or other grain to mar the delicacy of detail presented by the negative. Of the permanency of these pictures we can only express opinion founded upon theory, but it is something to say there is no albumen employed in their production. The chief difficulty is, of course, the printing, no frame yet introduced being suited exactly to the purpose, especially as this glass is often exceedingly thin, and the sizes of such small work vary so much. This difficulty is entirely removed by the frame we have before us, and which we will presently describe.

To return to the emulsion employed. There are several published formulæ, but the one we prefer as most suited to our purpose is made as follows:—

For a small quantity we take eighty grains of hard gelatine, and dissolve it by gentle heat in one and a-half ounces of distilled water; into this we pour a warm solution of silver nitrate, seventy-five grains in half-an-ounce of distilled water. We have previously taken the precaution of well drying a little sodium chloride and a little potassium citrate, and of each of these salts we take twenty-one grains, and mix them in half-an-ounce of water, dissolving by heat. This mixture we pour gradually into the warm gelatine and silver, stirring all the time, and then pour out the emulsion thus made into a small dish to set.

We prefer working in yellow light at this point and onwards, though a distant gas-light is no doubt harmless in such a process. When the emulsion is set, we take a basin of water and a piece of mosquito net, and squeeze the jelly through the latter into the water, keeping the hands below the surface, because this emulsion is much more easily melted by the heat of the hands than a firm gelatine bromide. After five minutes, with an occasional stir, the water is poured off, and the basin filled up again. In another five minutes the water is again poured off, and the emulsion is thrown on to muslin stretched over some vessel, and allowed to drain for half-an-hour, when it can be melted up at a low temperature. Two drachms of alcohol must be added, in which three grains of salicylic acid are dissolved, and one grain of chrome alum dissolved in a little water by heat. Upon filtering it through some fine material, such as two folds of cambric, the emulsion is ready for coating the plates.

We have described this process at length for the sake of amateurs and others who have never made bromide or other emulsion, but in practice it really takes a very little time to prepare a batch.

When necessary, the thickness of coating can be regulated to suit the negatives, a hard negative requiring very little emulsion, and a very soft one a thicker coating. As a rule, less is required than with bromide for negative work. Upon a plain opal glass, polished with whitening, the emulsion flows as easily as collodion, but when using the before-mentioned substratum, a glass rod will be required to distribute it evenly over the plate. We have found the side of a clean little finger the most useful, and harmless, for the purpose. It is better not to pour off the plate into the coating jar, as air-bubbles are very readily formed by this mixture, and spoil the work. Either pour off into another cup, or put only just the right quantity on. Dust is a great enemy at this stage, and must be provided against by covering the top of levelling slab, and three sides. During drying also, to avoid dust, we prefer adopting the plan suggested in one of the YEAR-BOOKS,

and placing the plates at the sides of an upright box, resting them against two nails, with one corner down, and the top corner hanging over to protect the surface.

The plan we recently advised of soaking plates in methylated alcohol can be adopted, but with the sacrifice of brightness in the finished picture.

The most suitable sizes are quarter plates, one-sixth, and one-eighth, though smaller than these are used with pretty effect. Miniature gilt mounts set in velvet with oval openings of two inches by one and a-half and upwards are especially suited to the purpose, and when the prints are vignetted plain or grey they form the most charmingly delicate specimens of pure photography that we can remember seeing.

We now come to the printing, which is rather more quickly done than with albumenized paper, but as in most cases it is far better to print under ground glass or tissue paper slowly, they take about as long as the others. This frame is the unpatented invention of Mr. R. Offord, Maidenhead, and is of such simple construction that anyone possessing a modicum of mechanical ability can readily make one for himself.

The principle upon which it acts is the same as that of a pneumatic plate holder, but it really more closely resembles the apparatus employed by dentists to sustain the upper set of false teeth in their place without the use of springs. For a photographic mechanician this description would, perhaps, suffice, but for the sake of our less highly gifted brethren we will describe it more fully.

A common five by four printing frame is taken, of the sort used with or without a glass bed; in place of the wooden back, a piece of stout zinc or tin plate is fitted to lie flat where the back would be, and projects at each end nearly to edge of frame. Mark distinctly one end, and one end of frame. Two holes are made at each end of this metal back at about a quarter of an inch from the side, so that four one-inch iron wire nails carefully fitted to the holes can be driven through them into the ends of frame about midway in the width of those ends. The nails being driven perpendicularly to the frame, when the heads are cut off the back, can be lifted up and away, and the cut ends of nails smoothed round with a file. Then the back will go on and off, and keep a perfect register.

The suction plate-holder consists of a circle of soft india-rubber one-tenth of an inch thick (red preferred) one inch in diameter. This is rivetted in the centre of the back, on the under side, by means of a brass or iron nail, and a brass washer rather less than three-eighths of an inch in diameter. An inch wire nail will answer the purpose of a rivet, and the washer must be fitted tightly upon it and rounded off smoothly on the upper edge, or it will cut the rubber. It is necessary that the one side of the rubber should be perfectly smooth, and when the rivetting is done it should stand up from the back like a small saucer or shallow cup, the smooth side inside. The secret of its use lies in the application of a little glycerine, which keeps the cup moist, and ensures perfect and continuous adhesion.

Cover the under side of back with black cloth up to the holes at the ends, leaving a circular opening in the centre rather larger than the rubber cup for it to work in.

To use this frame, first fix in it securely a 5 by 4 glass. A little shellac, applied with a hot piece of iron at the corners inside, will effect this. Place the negative on this glass, and secure it by thin strips of very narrow gummed paper across the corners. Adjust the prepared opal plate in the right position, which, according to position of negative, should be near the centre. Having moistened rubber cup with a little glycerine, put the back on the four pins, and press lightly over the centre to make the cup adhere to back of opal. Fix the springs as usual with, perhaps, a strip of cardboard under them to increase pressure. Progress can be ascertained readily by turning back the springs and raising the back, to which the opal will now be firmly attached. With a faulty suction-plate, the horizontal position, either face up or down, is the safest. The frame will register perfectly when the back and plate are replaced. For larger sizes than cartes, two suction-plates are used, about two or three inches apart.

Printing should be carried on as deeply as for paper, and vignetting, which is by far the most suitable style, should be done either on a turntable, or by frequently moving the frame to different positions. The washing must be very thorough, five or six waters not being too many, nor twenty minutes in all too long. Toning we succeed best in accomplishing in a borax bath, such as is described in the Year-Book. This must be done to taste, but we prefer artificial light, and continue the process until there is only a trace of red left in the shadows when viewed by transmitted light. An alum bath for five minutes secures immunity from frilling; but it must be clean. Fixing in a twenty per cent. hypo bath for at least ten minutes completes the operation, and the usual washing as for negatives must of course be thorough.

This emulsion will not keep very well, and the plates when long coated have a tendency to discolour. They will keep better if packed in paraffin paper or tinfoil. It is better to make smaller quantities as required, and when about to coat plates, to take as much from the stock as will answer the purpose, and not warm the whole batch several times. Discolouration is avoided by this method.

THE VELVET ROLLER FOR PHOTO-LITHOGRAPHIC TRANSFERS.

By far the greater part of the photo-mechanical processes which have been introduced up to the present time depend upon the use of an inking roller, and it is in the use of the inking roller that so many fail. Although the main object of the present article is to elucidate the method of working with the velvet roller, an instrument originally introduced to the photographic fraternity in these pages, we will preface our remarks by a few observations upon inking rollers in general.

The letter-press printer ordinarily makes use of a roller consisting of a soft composition of glue and treacle, or glycerine and glue, this roller being cast round a wooden core, having a central bar of iron running through it. The roller is usually mounted in a frame, and is provided with either one handle (fig. 1), or a pair of handles as

Fig. 1.

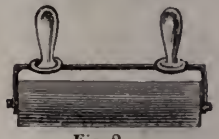
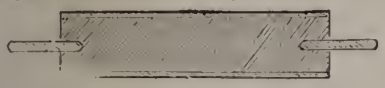


Fig. 2.

shown by fig. 2. When the surface to be inked is dry, the gelatinous roller answers very well, but it is ordinarily useless for those processes in which the surface to be inked is damp, as the moisture acts upon the surface of the roller, and so far softens it as to prevent the ink adhering. A gelatine roller, however, possesses the valuable property of being very easily cleaned with turpentine, and, moreover, such a roller can be easily made by anyone out of the chromograph composition which is sold for making copying slabs. It is merely necessary to melt the composition in a hot water bath, and to cast it in a brass tube which has been oiled inside, the core being supported in the middle of the mould.

A roller with single handle (fig. 1) is inconvenient, except in the case of an extremely small instrument, as it is difficult to control the amount of pressure given on the two ends of the roller; but when two handles are provided (fig. 2), and these are near the ends of the roller, it is easy

to keep the inking under the most perfect command. It is usual, however, when a difficult and delicate inking operation is to be performed, to make use of a roller having no frame, but simply projecting ends, as shown in the subjoined figure, these ends being furnished with sockets



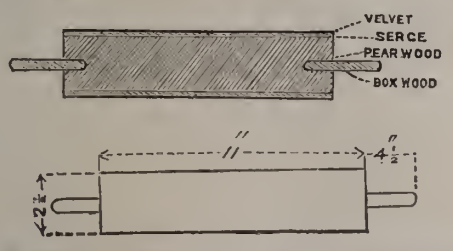
or covers of leather for convenience in working.

For lithography, collotype, and other processes in which a moist surface is inked, it is usual to employ a leather roller; but before this can be used with success it must be so thoroughly impreguated with ink that the material of the roller altogether refuses to absorb water. In order to "prepare" the roller, or give it this water-repelliug quality, it must be worked in ink or varnish at frequeut intervals during a long period. Time appears to be an essential element in the proper saturatiou of a roller with ink, and many failures have occurred through the use of rollers inadequately "prepared."

The velvet roller, of which our readers have heard much, requires to be thoroughly saturated with ink just as is the case with the leather roller, aud it sometimes happens that a little time elapses before the roller acquires the best condition for use. Probably much depends on the quality of the original velvet, and it is quite easy to conceive that the presence of a very small quantity of a gumming or mucilagious material in the dressing of the velvet would considerably hinder the free penetration of the fatty ink, and would favour the taking up of the moisture by the roller.

The substance of the following particulars has already appeared in the News, but as we have had several enquiries with respect to the use of the velvet roller, we take this opportunity of once more dealing with the subject.

The subjoined measurements specified are those to be recommended, and in the section we show the materials of



which the roller is made. After considerable experience, it is found that the *best silk velvet* is most suitable for the purpose. The body of the roller is of pear wood, a light material most favourable to the purpose, while the handles are of boxwood. Over the pear-tree block are sewn two layers of thick serge, and over the latter one thickness of velvet, the price of which is about twelve shillings a yard. A nice brisk nap is required in the velvet, and this cannot be obtained unless a good price is given.

The serge, before it is sewn on, should be scalded in hot water, so that it will not ruck afterwards, and the velvet must be fitted by a skilled seamstress. The so-called carpet stitch is best adapted to the purpose, the ends of the velvet not overlapping, but drawn together so as to meet. In this way the seam is not a ridge, but perfectly flat, and the roller does not set off at this spot. It need scarcely be said that this can only be attained with very fine stitches. The velvet is cut out exactly to size, and sewn on the block.

The roller may be put away in a linen bag as soon as done with, though perhaps it is best to clean first; the bag keeps away dust, and the grease in the ink will keep the velvet from becoming hard. Of course you can't scrape a velvet roller to get the ink off, as you do a leather one; you can only free the velvet of its ink by rolling. The roller is passed over a clean slab, and this is scraped from time to time. The slab gradually pulls the ink off, and this is then removed from the slab by scraping. If you are not able to get off all the ink in this way, pass the roller over a sheet of soft paper and apply a little turpentine. After a little practice you will soon know when the roller is free from ink.

The ink is thinned by the addition of turpentine, so that if at any time it is too thin on slab or roller, a little delay will at once mend matters to allow for the evaporation of the turpentine.

The transfer ink suitable for use with the velvet roller is made by mixing together two ounces of soft commercial transfer ink and one-fourth of an ounce of olive oil. This forms the stock ink, and, when required for use, it should be reduced to the consistency of cream with oil of turpentine. It is worked thoroughly into the velvet, and as the turpentine evaporates, the roller acquires the condition most suitable for inking up a transfer on gelatinized paper. The paper best suited for use with the velvet roller is thin bank post made sensitive by floating on—

Gelatine	3	ounces
Water	50	,,
Bichromate of potash	2	,,

The dry paper is exposed for about five or six minutes in the shade, and it is then soaked in cold water for a few minutes aud blotted off, being inked up with the velvet roller, just as if it were a lithographic stone.

It is of importance that the paper should be steadily supported under the roller; and an excellent method is to leave the sheet a little larger than the subject in one direction, and to double this extra margin under a thick slab of plate glass, after which care is taken always to roll away from the edge which is held. If the plate glass is thick and heavy, its weight will hold the transfer paper in position; but in other cases the glass may itself be held in a form of vice like the screw plate-holder, and in this case it is only necessary to turn down sufficient of the transfer to grip between the edge of the plate and one jaw of the plate-holder.

A TRIP TO THE GREAT SAHARA WITH A CAMERA.

BY A COCKNEY.*

Biskra is a green patch of palms, about two miles long and half a mile broad; but there are several other oases close by, so that agreeable excursions can be made on foot, or by car, over the desert tracks. An oasis is very much like the impression you get of it as a school-boy. The tall feather-tufted palms offer grateful shelter from burning sun and sand to the weary desert traveller, as he walks under their cool drapery beside flowing rivulets of water. For the palm trees require careful irrigation, to bring forth their date fruit, which, year by year, constitutes a rich and valuable harvest. Sometimes there is an opening among the trees, and here the well-watered land bears luxuriant crops of oats and barley, the fat green ears now within a few weeks of ripening. You stroll along in this green paradise—breast high in corn-fields, their grassy margin gay with golden brouzed marigolds and yellow star-flowers—until the palm stems gradually thin, and a wooden fence or mud wall brings you abruptly to the end of the plantation. Get over the stile, aud you are in the desert. Walk but twenty paces out of the shadow of the palm grove, and your foot is once more upon the hot arid sands.

Facing the main line of buildings, and close to the walled barracks, is a public garden with trees other than palms, and sanded walks and fountains, where the military band plays occasionally, and where is the fashionable promenade. A few streets, more or less regular, make up Biskra proper, and then, as you walk on through the plantation, there is a large opening in which a mud-walled negro village is the

* Continued from page 148.

principal object. A country road succeeds, flanked by green corn-fields, with here and there a copse of palms, and then, at the end of the oasis, is Vieux Biskra, the old Arab village, of the quaintest and most primitive construction.

We fix upon the negro village as the first field of photographic enterprise. The Arabs have not yet forgotten that the negroes were their slaves before the French came, and the two races still live apart. Each village has its chief, and each group of villages its cadi, who answer to the maire and prefêt of a French community. In these circumstances the government of the country is of the simplest. The military commandant holds the cadi responsible for the peace of his district, and if any crime is committed, he has to find the offender, and punish the latter to the satisfaction of the French governor.

In the negro village, the women do not conceal their faces. Here they are in the narrow street, laughing and grinning with delight, and dressed, not in white, like their serious neighbours, but in red and blue, and yellow and purple. What a pity the camera cannot give a trace of their picturesque garb! And the little black children! what wonderful piccaninnies they are, to be sure, and how quickly they scuttle off down a dark alley, or into their habitations, at the sight of a white face. There is a Café Maure, or native coffee-house, at the beginning of the village, where a lot of them are squatting round chattering; but I am so clumsy, and so slow with the camera, that they have all disappeared, and only their white teeth are to be seen grinning round the corner, by the time I am ready with my plate.

So I leave the apparatus and wait a while. One after another they shyly come back. But they will not venture beyond the shelter of the house; they seat themselves in front and look on. This will do nearly as well, and with a quick motion of the cap, I hope for the best. Then Jones and I move away down one of the streets. There is a bit of a square with a tree in the middle; a figure is asleep here, and further on are other negroes squatting silently before their doors. This time I am more fortunate. Despite the warning shouts of the little blackies, who keep hovering round, afraid to come to close quarters, the recumbent figure remains dormant, and the squatting habitants still squat motionless. I expose two plates and move on.

The next selection is a cross road, where two narrow streets of mud houses meet at right angles. The darkies, both old and young, have by this time acquired confidence, and when Jones puts one here and another there, distributing a few sous as he goes, the camera becomes quite popular, and the negro village begins to enjoy the joke quite as much as did the good people at Constantine.

And now a word about the reflector lantern, which, with its large square of orange glass, has been safely carried in a cardboard box some fifteen hundred miles. It is a capital illustration of what may be done with a little care and forethought, as I take the first opportunity of pointing out to Jones by way of moral. "Yes," he says, "it certainly does prove what a careful traveller may undertake. But conveying the lantern was the least I had to do, remember. How often, I should like to know, have I prevented you from sitting on it, or smashing it with your beastly luggage!" I did not think I had heard aright, and I said so. "What I mean is, that there is a precious deal more credit due to me than if I had travelled alone." I really don't know what has come to Jones, or what he means.

But whatever slight trouble was connected with the lantern journey, this was repaid a hundredfold by the kindly reception its bearers received at the hands of the owner. M. Foureau, to whom the apparatus served me by way of introduction, is not only an accomplished amateur photographer, who makes Biskra a residence for several months in the year, but he is a man of high scientific attainments, and with considerable experience as an African explorer. He exposes as many as a hundred plates sometimes on a tour, using a half-plate camera constructed by Jonte, of Paris, which weighs but two-thirds of the weight of mine, and collapses into a flat box-like form, far less liable to injury than my more solid apparatus. Whether you take a photograph with the plate upright or sideways, the front of the camera always remains in the same position. The back, however (and the bellows), is so loose that you can lift it up and twist it round bodily, whenever you want to change from a vertical to a horizontal position, the rear of the apparatus being screwed fast as soon as changed.

But M. Foureau, albeit this little camera has now served him three years in the desert, is not satisfied with it. Wood will not stand the extraordinary changes of the climate, and hence he has given the order to have a camera made of aluminium. This will be both light and rigid, while it will bear any amount of knocking about. M. Foureau, I may mention, always employs oxalate development, but as the African sun is rather powerful, he never makes use of fresh solution in his first treatment of a plate. The old solutions are invariably employed, these being carefully stored up in well-stoppered bottles (kept full); without this developer he never attempts to work.

M. Foureau tells me something about the value of an oasis and date-bearing palms. Apparently the cultivation of dates is one of the most paying of speculations, and some of my readers will be as surprised as I was to hear that you need not stop to find an oasis to grow them in; you may make one for yourself. Already many artificial oases have been created, and every year the number increases. A spot is chosen in the desert that shows some sign of herbage, or, in other words, where it is likely water may be found without difficulty. Here an artesian well is made, the soil is irrigated, and date palms are planted. After a few years they bear fruit, and in its prime, a tree will produce a hundredweight or more of dates, the value of which, weight for weight, is equal to that of corn; for dates constitute the main food of man and beast in many of the districts of the Sahara.

By the way, M. Foureau has a difficulty in getting pure water for photographic purposes, and hence makes use of a solar distilling apparatus to obtain it. His parabolic reflector of silvered metal is about the size of a large umbrella inverted, the boiler (which takes the place of the umbrella stick, and upon which the heat rays are concentrated) being large enough to distil about a litre of water during the half dozen hours it is exposed to sunshine every day. At the Biskra hospital they have a similar arrangement for distilling water, which produces some thirty litres of pure water per diem.

On our journey to Biskra I counted no less than two hundred camels during the day—or rather dromedaries, I think it is more correct to say—coming along in droves that varied in number from three to thirty. Most of us are aware that a camel will journey several days without drinking, but it is not so well known that the patient animal can go without eating almost as long. If in good condition and after eating its fill, it is stuffed by hand, as travelling Arabs are wont to do, then a camel will go a week or more without food. Near the villages, it is the custom of these caravans, whether large or small, to encamp in the open desert; but to afford them protection elsewhere, there are high walled enclosures, termed caravansaries, in which they are at any rate secure from surprise during the night. South of Biskra, the villages and oases are few and far between, and the French hold only one more military post, that at El Oued. In fact, the first covered building on the track southwards is a solitary blockhouse thirty kilometres from Biskra—you can get a glimpse from the housetops of Biskra of its roof, shining like a pebble in the plains of sand—and the nearest inhabited dwelling is fifty kilometres away. There are, however, regular postal arrangements both with El Oued and Turguth (some four days' journey south), mounted Arabs being employed to carry the letters.

In these circumstances Biskra is a favourite halting-

place for caravans, and as you emerge from the oasis in early morning, you may often count a dozen groups of recumbent camels, the women and children of the caravan usually grouped in the centre. To get a few pictures of these encampments was naturally our ambition before leaving the oasis, so one morning at sunrise, Jones and I quitted the oasis with camera and plates, with this object in view. To the south-east there was the never-ending Sahara spread before us, an eternal flatness, all the more impressive because of the clear limpid atmosphere; behind was the red ridge of the Col de Sfa, as sharply limned as if it were of painted cardboard but a hundred paces off.

There are plenty of encampments to choose from, so we are not long in getting what we want. At one point a dozen camels lie together in a picturesque group, and we approach to within twenty paces. Alas! before I have done focussing, a wretched dog has jumped out of the circle, and is baying and barking at the legs of the tripod. Some half-sitting figures rise to their feet precipitately—women almost black—and the camels stretch out their snake-like necks. A rapid exposure is made, but before I can turn the slide round to get a second one, Jones cries to me to "look out."

It is a couple of Arabs who are striding along as fast as they can without running. They have been down to the brook, and return hastily to see what it is we want with their camels and women. Fortunately, they leave the camera on one side, and make straight for the encampment; one of them speaks to the women, and stands looking defiantly at us; the other viciously kicks one of the camels, and gets it on its legs. The standing animal invests the group with a pyramidical shape; I wait no longer, but expose quickly, hoping for the best.

Neither of us is afraid, of course, but we think we had better move off, and so we do. Another group is approached, and two more plates exposed, with not less success, it is to be hoped. But the scene around is getting rather too lively to be pleasant. There are dogs barking in all directions, and in every encampment are signs of moving figures. The Arabs are getting ready for the day's march, no doubt; and as neither Jones nor I would think of delaying them for a moment, we at once withdraw with the camera. Besides, it is breakfast time, and we are both *fearfully* hungry—another good reason for hastening back as fast as we can.

THE ETHER-OXYGEN LIME-LIGHT.

BY LEWIS WRIGHT.

The Chadderton explosion has pointedly directed attention to this form of the lime-light, and it is an important question whether or not, as stated in a letter to the *Daily Chronicle*, it ought to be avoided by all public lecturers, for it has marked advantages. Its effects are, as stated by me some time ago, at least as brilliant as oxygen burnt with house-gas in a "mixed" jet, and sometimes more so, for I have successfully shown a crystal of Brookite (a most difficult one owing to its strong red colour) in the polariscope with the ether light, which on a previous occasion had baffled me with house-gas. And to be able to use the "mixed" or most brilliant form of jet in a country village where there is no gas, must be to many a great boon.

First of all, it ought not to have been stated by Mr. Etheridge in the *Daily Chronicle*, that the apparatus which exploded was the "ethoxe." That name was adopted by Mr. Broughton, who devoted much time and study to perfecting this form of light for his particular form of apparatus; and whatever merits may belong to other forms, that name ought to be left to his, and no one else has a fair right to use it. This is a case in point, for it is not the "exothe" which has exploded. Some time since another explosion took place, also *said* to be of the "exothe," but it was not; and the unfairness of pirating the name needs no further proof. Let every inventor or improver Christen his own apparatus, and stand or fall by it alone.

As far as I can ascertain, the apparatus which exploded was only a modification of the very earliest or wash-bottle form. To use such a form habitually would be in my opinion, for reasons which will appear, an effectual form of suicide, and I have seen two other forms of apparatus emanating from Birmingham which also appear to be highly dangerous. Mr. Diggle being a photographer, however, this journal has a sort of double claim upon him, and he would confer a real service on many by fully describing his apparatus, and every ascertainable detail, even the most minute, which occurred on the eventful evening. We ought to have the exact quantity of ether used, its quality and price, and where bought; the size and top area of the bag, the weight used, and anything else that can be known. Meantime, it is only possible to treat the matter generally.

Whether the ether light is "dangerous," then, "will depend." On the one hand, it has special dangers or risks above and beyond those of mixed gases; on the other hand, these admit of being certainly guarded against. But they will only be by that class of people who, fully realizing the dangerous points, are absolutely methodical and cool in the methods needed to meet them.

This is readily seen if we consider the nature of the process. From one bag of oxygen a small portion is passed through ether, and in its passage becomes saturated with ether vapour, which is burnt in place of house-gas. Another tube from the same bag feeds the oxygen to the jet as usual. Thus the same pressure is given to both, which is very handy and simple.

Now comes the element of special danger. The *saturated* mixture cannot explode, but only burn; and a small quantity of oxygen carries over a large quantity of ether vapour. But when the vapour is diluted with some thirteen times its bulk of oxygen it is violently explosive, and much less than that is probably very unsafe. Hence in the "wash-bottle" or any other "very simple" form of generator, appalling danger may arise in either of three ways:—1. The supply of ether may become so far lowered that the bubbles of oxygen do not rise through sufficient liquid to saturate them. 2. All but absolute ether contains some alcohol and a little water; and in using this over and over again, the ether may become so much diminished as to lead to the same want of saturation. 3. The ether will vaporize by the mere heat of the room sufficiently to create a small pressure in the generator. If, then, the tap connecting with the oxygen bag *should be opened first*, liquid ether will be driven back with the tube supplying oxygen to the jet, or may be even with the bag itself, thus forming an explosive compound. We may distinguish between the last and first two causes of explosion by the results. In Nos. 1 and 2 the explosive compound would be in the generator, and *that* would burst. In No. 3 the *bag* would burst. At Chadderton the bag burst; and therefore ether must have been driven back by pressure into the bag, by some mismanagement or accident with the taps and weights.

As long as the ether flame (without oxygen) is *white*, it is saturated, or nearly so. A blue flame shows the vapour is either explosive, or very near it.

Now for the conditions of safety, *not one of which can be neglected with impunity*, permanently, though it is wonderful how Providence watches over fools. First of all, good ether must be used; 730° will do, but must not be more than thrice used, and ought not to be more than *twice* used, keeping each remainder (*i.e.*, second or third) in a separate bottle. That some ether be "wasted" is then a *sine qua non*, though most people can find some other use for the waste. To fill the generator away from a flame is obvious.

Secondly, I consider that every generator *ought to have an empty chamber* to receive any suck-back or splash-back of ether which *may* occur, either from an upset or back-pressure. The want of this is the most dangerous point about all the Birmingham and some other apparatus I have seen. An

empty cell is not enough; it must be so arranged that the ether *cannot* splash direct with the oxygen supply-tube; that is, this tube must not open opposite the place where the splash, if any, must occur.

So predominant is this special danger, that in the American patent generator of Mr. Fred. E. Ives, purchased and now made by the McIntosh Company of Chicago, a fluid tank is superseded by rolls of cloth saturated with ether, through which the oxygen is passed. The desired object is attained; but such methods fail to ensure *saturating* the gas, as the supply of ether is apt to prove insufficient towards the end. The vendors of this generator, in fact, in their circular actually contemplate the blowing off the ends of the generator, and its catching fire, as an event to be by no means unexpected, and give directions for "smothering" the flame. I do not share their confidence that such accidents would always be harmless.

Thirdly, the generator must contain *ample* ether to cover all contingencies, and be so constructed that the use of the required portion *does not diminish* the quantity in action, or the path of the oxygen through the fluid. In M. Broughton's generator, ten or twelve ounces are placed in the reservoir, and about four ounces is used during two hours. The reservoir is traversed by a number of horizontal septa or partitions, which compel the gas to travel backwards and forwards in a path which is not shortened till a certain level is reached. This is the great point, with an empty or safety chamber, to be looked to in all generators; and none ought to be purchased without a diagram. I wish M. Broughton would bring his own generator fairly before the public; but in that case I consider even he ought to furnish an exact diagram of the interior, that the operator might know precisely what he was doing.

I am not sure we have the most perfect generator yet. I should be inclined, were I planning one, to construct it with a *feeding reservoir* made of glass with a cork in the top, so that the precise point of the fluid could be seen, and more put in if needed.

The best taps are needed. And as ether will dissolve all grease and make them "grind," they may be lubricated with glycerine. After use, all the ether should be *at once* emptied out, and transferred to the proper bottle as "once used" or "twice used." That "twice used" should only be used the third time with one-third of fresh ether.

Last, but not least, is *method*. There is only one; and those who cannot depend on themselves never to vary it, are in danger; for the taps must be used in a certain order and no other. Suppose all the tubes connected—oxygen-bag on to the generator, with a branch to oxygen-tap of dissolver, and vapour-tap to the hydrogen of dissolver. There will be vapour pressure in the generator; and if the bag-tap or oxygen-tap to dissolver be turned on first, ether will be driven back as already explained. The hydrogen-tap of dissolver (or jet) must be *turned on first invariably*, to give vent to all pressure, and not till that is done must the oxygen from bag be turned on; then, in a moment or two, long enough to clear the tube of air, but not enough to make explosive vapour in the lantern, light the jet, after which, when the lime is warm, turn on the oxygen and adjust as usual. At the end or when stopping, turn off the oxygen at jet *first, always*. If only a stoppage, leave the hydrogen taps on a little as usual, and *never turn them off first* in any case; but next turn off the oxygen at the bag if the exhibition is at an end, or if you must put out the light. The vapour-tap to the jet, in brief, must be *first and last vent of the generator*. And never use less than one hundredweight pressure on the bag.

I confess I cannot see how an explosion is to occur under these conditions. But it will be seen how remarkably easy it is to neglect one or other of them; and the real way to safety is to see the precise danger of each breach, which I trust will now appear. I ought, however, to add that Mr. Broughton considers he has at last discovered an absolutely secure "safety packing." It is well known that explosions have occurred through the common gauze-packing, which is a vain delusion, doing more harm than good; through Hemming's safety packing of wires wedged in a tube; and even through Gurney's water-chamber. Mr. Broughton uses pumice-stone, granulated to a certain gauge, and tells me that owing to the checked and irregular paths thus caused, an explosion cannot be made to pass through it. Rather than pack the jets with this, he prefers a separate chamber, with a fluted union-nozzle at each end for india-rubber tube; and one of these may be connected below each of the jet or dissolver nozzles. They, however, reduce the pressure and the light considerably, and heat will be needed to get the same result as with heat without them. This packing is, however, well worth experimenting with, and if really found certain will be a great boon, as such chambers with unions can be used on any lantern without the least alteration.

The danger from dust in the oxygen-bag itself is to me a very doubtful matter. But if it exists, I may, perhaps, point out that it can be absolutely guarded against by "filtering" the gas, either in the dry, wet, or adhesive manner.

It may not be amiss to point out how seldom any loss of life occurs from explosion of a bag. As a rule, there is a loud report and severe concussion, with much breakage of windows, but no more. I only really remember one case, though there are doubtless more. At Chadderton, also, there was no death directly caused—a few seem to have been stunned, and a few probably etherized; but the death occurred from crushing or suffocation on the stairs.

FRENCH CORRESPONDENCE.

Frame for Sensitive Pellicles—Photographic Jurisprudence—Laboratory of the Museum of Decorative Arts—Pocket Photographic Apparatus—Operators' Examinations.

Frame for Holding Sensitive Pellicles.—The Abbe Raboisson has shown a new kind of holder for pellicles, without having recourse to glass plates. It consists of a framework of sheet brass, the four sides of which form clippers. It is connected by two cross-bars of brass acting as springs. In use, this frame is placed at the back of the sensitive paper or pellicle, the edges of which should extend about half-an-inch beyond all round, so as to be folded over into the clips. Then place in the dark slide, when the brass springs, pressing against the side, act in stretching the pellicle. The idea, although ingenious, is subject to various inconveniences: first, these frames are tolerably heavy—a great disadvantage, overcoming the essential aim in using pellicles; secondly, they are also rather bulky, varying from one to two centimetres in thickness; thirdly, they necessitate the waste of paper or pellicle, as at least an inch all round the edges has to be sacrificed for the purpose of clamping into the frame. The question of cost need not be considered, as the price paid for any article perfectly adapted to its requirements is never money wasted. For my part, I have not found anything better than diachylon for general purposes.

Photographic Jurisprudence.—The Tribunal of Paris has just given judgment in a case of copyright of photographic works in which photo-engraving was accounted the same as any other photographic work, and that no distinction could be made between an ordinary print and one taken from a photo-gravure plate. This seems rational enough. Why should the word "photograph" only apply to a silver print? It is a very common mistake for people to say, "This is a photograph, and that a photo-engraving," as if photography did not result in an impression taken by the aid of light. The tribunal has even stipulated that the retouching, often so important on a photo-engraving plate, does not constitute a secondary operation, the photographic work being the principal part. It would be as

well not to adopt this statement; if the photograph were not impressed on the metal as the design to be followed, the engraving would result from the graver directed by the engraver's hand.

The Laboratory of the Museum of Decorative Arts.—At the Laboratory for the reproduction of objects of art, work is about to commence. It has been decided as a general rule that all negatives shall be pellicles, and capable of printing from either side, according to the nature of the print desired. As to the prints destined to be preserved as documents in the books of the Society of the Museum, they will all be in platinum, so as to ensure permanence. The platinotype seems more suitable where only a few copies are required, as carbon is too complicated.

Pocket Photographic Apparatus.—My pattern pocket apparatus is now finished, and was shown at the last meeting of the Photographic Society of France. In the course of two or three months, therefore, the most portable and lightest apparatus will be before the public; the name of M. Francais, who is the manufacturer, ought to be a sufficient guarantee for its good workmanship.

Operators' Examinations.—The examinations for photographic operators organised by the Chambre Sydicale will take place on April 7th and following days. It is probable that there will be a good number of competitors.

Leon Vidal.

PHOTOGRAPHY CONSIDERED AS THE WORK OF RADIATION.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

The second lecture of this series was delivered at the Royal Institution on Saturday last.

After referring to the last lecture, and exhibiting prints showing the two states, red and blue, in which gold could be deposited, the lecturer said that hitherto they had been considering the changes produced in metallic compounds, chiefly those of silver, by radiation. He would now remind them that molecular changes produced by radiation were to be met with on every side, and photographic action must have been noticed in very early times, for the tanning of the skin was of that nature. A frame that had contained a printed notice was exhibited, the back-board of which had been darkened except where the black ink letters protected it, thus producing a negative picture. Some paper prints also were shown which were produced by the action of light on certain dyes, and would explain why sometimes the ladies' dresses faded in colour.

Turning again to the molecular changes produced by light, the lecturer asked his audience to remember that there was a certain amount of work done. In separating the particles of silver and chlorine, for instance, a very considerable amount of energy was absorbed. By a series of calculations he showed them that in blackening a square inch of silver chloride to a depth of $\frac{1}{1000}$ of an inch, the light acted on 1½ million millions of atoms, and the energy expended separating the chlorine atoms was equal to that required to raise the chlorine to a height of about 3,000 feet.

He had now to come to the question of development, to the production of photographs, in which the amount of work actually done by radiation was small, the rest being accomplished by chemical means. It was singular that development, both in the case of the Daguerrotype plate and paper processes, was discovered by a fluke; the first had come about by Daguerre leaving an under-exposed plate in a cupboard containing an unstopped bottle of mercury, and the second by the Rev. J. B. Reade, who exposed a piece of Talbotype brushed over with gallic acid as well as nitrate of silver.

To explain the theory of development he would have to draw their attention to a few experiments. Firstly, he would draw their attention to the two little magnets covered by a plate of glass, and thrown on screen by the horizontal lantern. When iron filings were shaken over them, the particles joined one another, and arranged themselves in lines round the magnets, producing what was known as Faraday's lines of force. In an upright cell in another lantern, acetate of lead was decomposed by electricity, crystals of lead rapidly growing round one pole, the particles as they were deposited being attracted by those already formed. A very beautiful specimen of lead tree was shown in a sixteen-ounce flask, the crystals being very long and well formed. Several photographs were then taken on paper and collodion to show that the particles acted on by light were first reduced, and the reducing action continuing, other particles joined those already reduced, and built up the image. In development, however, it was necessary to have some kind of restrainer, or the reduction proceeded too rapidly, and the particles of metal were deposited uniformly over the surface or film. Chloride of silver was immediately blackened by a developer, but when a physical restrainer such as gelatine, or a chemical restrainer such as bromide of potassium, was used, a clean picture could be produced. These experiments were successfully shown.

Notes.

Our Paris contemporary, *La Nature*, gives this week, by way of illustration, a balloon photograph taken by Mr. Cecil V. Shadbolt.

In the same number, the familiar name of M. Carlos Relvas occurs in connection with an invention of some importance. M. Relvas, of Gollega, Portugal, who has probably taken more medals than any other amateur photographer at various international exhibitions, has of late, it appears, given some attention to the saving of life at sea, and *La Nature* shows a picture of the new Relvas lifeboat—a narrow trough that cuts through the waves easily, flanked with broad cushions of cork to float it—which, after practical trial by the Portuguese government, has been highly approved. It is always pleasant to meet with a photographer who is something more than a photographer.

The names of the sectional officers of the ensuing meeting of the British Association, which is to be held in Montreal in August next, have just been published. The president-elect is Lord Raleigh, while the section for mathematical and physical science will be presided over by Sir William Thomson, and that of chemical science by Professor Roscoe.

The Photographic Society announce that it is now in a position, on application to the Secretary, to exhibit to apparatus makers the standard screws and gauges the Society have adopted. The standards are in steel, and have been manufactured by Sir J. Whitworth and Co., a pretty good proof of their excellence and precision. Still, we doubt much whether manufacturers will be overjoyed by the news.

Speaking of the Photographic Society, by the way, and the list of its officers just issued, it is a little difficult to guess by what plan the titles of different members have been selected for publication. Thus, Professor Donkin, the new-elected Secretary, although a Master of Arts and Fellow of the Chemical Society, is credited with neither of these distinctions. Mr. Maxwell Lyte is also a University man, if we mistake not, and it is scarcely a year since Mr. Swan had a degree conferred upon him by Durham. Again, most of our readers are aware that Mr. Ackland is a member of the Royal College of Surgeons. Yet the official list of the Society makes no mention of any of these facts.

The Committee of the Photographers' Benevolent Asso-

ciation naturally complain of the scanty support they receive from the profession generally. The receipts from ordinary members amounted last year to about thirty per cent. of the total income, certainly a small proportion. It is, however, the experience of nearly all benevolent associations that the great bulk of the funds is made up by donations from a small number of generous men, and by subscriptions from outsiders. People, even though the object be their own benefit, will not voluntarily subscribe to benevolent associations, and societies who want to show a good balance are compelled to employ energetic canvassers. Whether such a course would be advisable in regard to the Photographers' Benevolent Association it is for the Committee to consider. One fact in the report is, however, consoling. It was only found necessary during the past year to expend £6 in grants. This, at all events, shows that photographers, as a body, are independent, if all are not well-to-do.

All of us have heard of the wonderful alligator photograph, and the more wonderful story still how it was taken by a phlegmatic Englishman. There is a similar photograph exhibited in Paris, of a lioness crouching down under some olive trees, quite different to the ordinary Zoological-Garden's treatment. M. Geiser, of Algiers, told us the story of this photograph. The lioness belongs to an Arab priest, or Marabout, who has blinded and tamed the creature; it follows its master like a dog, and will obey in a most docile manner. Posed by itself under a group of trees, it makes a most effective picture, of which the photographer was not slow to avail himself.

"Two Photographs" is the title of a bright little comedietta that precedes Miss Minnie Palmer's clever performance at the Strand Theatre just now. The gist of the piece is, that two mature lovers, unable to make up their minds, advertise in a matrimonial newspaper for husband and wife respectively. Each of them receives an offer, and, in response to a request for a portrait, they send photographs taken some years ago. It is needless to add that, unbeknown, they are corresponding together and employing the aid of photography to take one another in. But it is not until they actually meet that the youthful portraits are mutually recognized, and then, like sensible people and sensible actors, they bring the drama to a happy ending.

The little play is by Mr. Arthur Clements, and in it we are told that "Devonshire air is good for photographs," while the moral—a very good one—is, that you should always exchange portraits to date. The ladies, Miss Grey and Miss Bufton, have little to do, the burden of the performance resting on Mr. Harry Proctor and Mr. Phillip Ben Greet. Mr. Greet, a young and painstaking actor, new to London, is particularly pleasing as the elderly beau, and sustains the rôle with all the ease and grace of a finished artist.

Mr. F. Hollyer has been awarded a gold medal at the Boston (U.S.A.) Exhibition, for his series of platinotypes.

That silver prints made now-a-days are less permanent than those made fifteen or twenty years ago, seems to be generally admitted, and it is instructive to note the views of Mr. Foxlee on the subject at the last South London meeting.

In the old time it was the custom to salt the paper more highly than is usual at present, to sensitize on a stronger bath, and to make use of denser negatives; all these circumstances tending towards the production of an image rich in silver, and exhibiting much body when viewed by transmitted light. The thin surface pictures of the present time are not only poorer in silver, and consequently more liable to destruction, but it is usual to make the albumen film itself thicker than formerly; and the albuman—perhaps by virtue of the sulphur which it contains—is undoubtedly a main factor in determining the fading of a print.

Mr. Foxlee exhibited an old stereoscopic picture, which had evidently been printed from a negative of which one half was much denser than the other, and the printer had shaded the weak side in order to obtain an approximate equality in the appearance of the two pictures. The image from the dense negative naturally consisted of a heavy deposit of silver, while that from the thin negative was much less rich in silver. This latter had suffered much more by time than the dense print.

In reading his paper on dark-room illumination on Tuesday night, Captain Abney contributed an interesting little fact to the history of photography. It was to the effect that Claudet was the first to suggest, in 1844, developing the latent image under the eye of the photographer. Till then, the Daguerreotypes had been evoked in the dark, and the operation of development was a purely mechanical one. M. Claudet took out a patent in the year named, for employing a red light which should be without effect upon the solarised image, while it enabled the photographer to see what he was doing during development.

Mr. Spiller's remark on the use of aurine for dark-room windows is also well worth writing down. Aurine dissolved in spirit, he had employed with considerable success, Mr. Spiller said, for dark-room illumination; while its non-actinic colour constituted it a very suitable medium, it was not a pigment, like chromate of lead, but a true stain, and hence its colouring matter did not consist of separate minute particles.

In respect to this subject of dark-room illumination, no matter how widely divergent the opinions expressed of late, there seem at any rate one or two points very clear—viz., that an orange light affords sufficient protection to the photographer under ordinary circumstances, and that the advocates of ruby light grow fewer every day. We have repeatedly said that in the matter of light in the dark-room, it is for the most part a question of "give and take." If you want to exclude all actinic rays, have recourse to a deal board or a brick wall at once; but if you want to see when

you are at work, light of some description must be admitted. And we repeat here that diffused orange light—as little of it, or as much of it, asyou please—is in our opinion theleast injurious to the film compatible with permitting you to see what you are doing.

The "stained red" glass, we may mention, of which Captain Abney speaks so highly, is not, it must be remembered, red at all, but actually orange; this with a sheet of tissue paper to diffuse the light, was in his opinion one of the best mediums for the dark-room.

By the way, we were very glad to see that Mr. Debenham took Mr. Ray Woods roundly to task for speaking of the green glass the former uses as "Cathedral green." As Mr. Debenham very strongly insisted, the name in question applies more to the make of the glass, than to its colour. Where on earth Mr. Woods got the name "Cathedral green" from, we can't think!

In respect to the proposal recently mentioned in these columns to take the electric spark as a standard light for sensitometrical purposes, it may be pointed out that an identical proposal was made about three years ago by Dr. Stolze, of Berlin, who makes use of a drying chamber in connection with the discharging apparatus. It consists of a glass tube, which encloses both the terminals; a depression in the tube serving to contain a desiccating material, such as chloride of calcium.

Although not altogether novel, this simple plan of Mr. Coolidge for producing photographic caricatures is well worth noting. We see that the idea is announced as patented in the United States, but we are not aware that

any steps have been taken to protect it in this country. Mr. Walzl, of Baltimore, announces a selection of humorous backgrounds suitable for these caricature portraits, and no doubt, if any demand for them arose in this country, they would soon be forthcoming. Indeed, with this hint before them, many professional and amateur photographers could make some suitable sketches for themselves.

Patent Intelligence.

Applications for Provisional Protection.

4404. Benjamin Pryor Stockman, of 3, Poets' Corner, Westminster, in the county of Middlesex, Civil Engineer, for "An improved method or process of colouring photographs, drawings, printed subjects, or the like."—Dated 5th March, 1884.

Notice to Proceed.

5204. Harrison Garside, of the city of Manchester, in the county of Lancaster, Photographer, for an invention of "An improved method of producing surfaces for mechanical or ink printing by means of photography."—Dated 2nd November, 1883.

4471. Richard Brown and Robert William Barnes and Joseph Bell, all of Liverpool, in the county of Lancaster, for an invention of "Improvements in means for and method of producing designs upon paper or other fibrous or soft material."—Dated 19th September, 1883.

Specification Published during the Week.

3584. J. F. Cooke, of 6, Oxford Court, Cannon Street, for "Improvements in frames for photographs and other pictures."

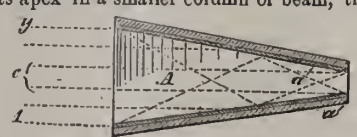
It is especially adapted to cases where the photograph or picture is seen through a piece of plate or other glass having a bevilled edge, and nothing outside such bevilled edge; but it can also be readily adapted to other styles of frames. To hold the photograph or picture against the glass, I take a flat sheet of metal or other suitable substance of the size required, and I so bend over two of the edges opposite to one another, that the said sheet of metal or other substance will slide over two of the edges of the glass, and so hold the photograph or picture securely against the back of the glass through which the photograph or picture is seen. The edges so bent over, being seen when the photograph or picture is looked at through the glass, are not necessarily left visible along the whole of those sides of the frame, but the edges so turned over may be in parts cut away, provided enough of them is left to hold well on to the edges of the glass. I also vary the shape of the metal or other substance where it is turned over in such way as to make it ornamental. The frame thus made stands by means of a projecting strut or foot attached to this back in the ordinary way in which a foot or strut is attached.—*Provisional protection only.*

Patents Granted in America, Feb. 26.

294,059. Haskell Harris McElhiney, Nebraska City, Nebr. "Photographer's retouching-point."—Filed Dec. 5, 1883. (No model). A retouching pencil attached to a spiral spring, of which the other end is connected with the vibrator of an electric contact breaker. (See description of a similar arrangement by Geruzet and Geesbergen on p. 645 of our vol. for 1883).

294,117. William Calver, Washington, D.C., "Method of and means for condensing solar rays.—Filed April 25, 1883. (No model).

Claim.—1. A condenser for solar rays, comprising a frustum of a pyramid, or its described equivalent, the length of the same and the inclination of its walls with its axis being relatively determined to advance the rays entering at its base, and to deliver them from its apex in a smaller column or beam, the whole con-



structed so as to withstand high degrees of heat, substantially as specified. 2. A solar condenser comprising a hollow frustum and a surrounding water-space provided with an inlet, an outlet, and a steam outlet, each provided with controlling-valves, substantially as specified. 3. A solar condenser comprising a frustum of a pyramid, or its described equivalent, having inner reflecting walls or surfaces, *a*, and an outer re-enforcing and protecting backing, *a'*, substantially as shown. 4. The combination of the condenser, swivel-bracket, and tripod, substantially as shown and described. 5. The combination of the condenser, jacket, steam-dome, inlet, and outlets, substantially as shown and described.

OLD PHOTOGRAPHS.

BY EDWARD DUNMORE.*

There is a ring about the words "Old Photographs," sentimental as well as scientific. I now particularly allude to landscape work, than which no occupation could be devised more conducive to health and pleasure. With portrait photographs it is somewhat different. The actors may have passed away, leaving but old memories behind, fused in the crucible of time which the magic of an "old photograph" separates.

* Abstract of a paper read before the South London Photographic Society.

The occupation of looking through a collection of old works and comparing them with recent ones is far from labour thrown away, especially if they have been one's own work. We may recal an experiment, the result of which was thought little of at the time it was made, but now, a new light being thrown on it by experience, becomes a valuable hint. The extreme importance of making notes of our experiments, if carefully performed, can scarcely be overrated. Memory is apt to play us tricks if not supported by written notes, especially if a good number of similar experiments are made, which is generally the case in working up a new process. A very little variation may mean success or failure, and it is just as well to be on the safe side by reference to methodically-kept memoranda. Since photographs we call "old" were made, photography itself has assumed a new garb and an importance in the arts and sciences that could hardly have been anticipated.

The thanks of photographers of the present day must be accorded to those persevering pioneers and experimentalists who, when the art was in its babyhood, so nearly hit on the ways and means we now adopt, and which, even after a lapse of thirty years, still form the foundations of our process. In a measure we seem to be reverting to the original plans. Paper was more successfully used in the old calotype process—one of the earliest processes discontinued—to give place to its diaphanous and brittle successor, glass. Now, again, paper is being used extensively for sky negatives and also as a support for gelatino-bromide films for landscape work on roller slides, and also in compressed blocks. Pyro-development has again come to the front in place of iron, with this difference—alkali is added instead of acid. All through the processes of negative making changes continue to be rung on similar materials, and no absolutely new departure made. With mechanical processes wonderful improvements have been effected. The working of them is, however, in comparatively few hands.

The very fact of continuing the work so much on old lines suggests the question—In what manner and degree is a modern superior to an "old photograph?" The answer is somewhat difficult to give. Is it in permanency? Surely not; for here we have prints that have proved their claim to be called "permanent" by the fact of some twenty, thirty, or more years of existence, and are still bright, good, and apparently unchanged. Is it in delicacy or quality? No; we may fairly say some photographs were produced of as good quality in the early days as at the present time, judging from the examples we have the opportunity of examining. Then what is the improvement obtained by thirty years' experience if it is not in permanence, delicacy, or quality? The superiority, where any exists, is entirely outside the chemical qualities or the actual making of the photographic print, and rests altogether in the artistic treatment and feeling imparted to the subjects, aided by skill naturally acquired through familiarity and practice.

I said "some" photographs were equal in quality to those now produced. It must be borne in mind that thousands and tens of thousands of photographs are made now to one made formerly. Manipulative skill is possessed by thousands where one was skilled in the early days. In the early days it was a rare thing to see a thoroughly good photograph—not because they could not be produced, but by reason of their limited number and there being so few to produce them. Beginners or unskilled persons generally turned out that kind of effect called "soot and whitewash." There is no doubt that the extra sensitiveness of our films will do much to alter the character of future work. This, with the unquestionable advantage of having plates ready for use at a moment's notice, instead of waiting for the completion of the many preparations necessary to be made in the old wet-plate days, must exercise considerable and favourable influence in securing negatives.

The permanency of photographs has always been a thorn in the side of the photographer, or, I should rather say, the want of permanence. With all the improvements in apparatus, uniformity in chemicals, and experience, the charge of want of permanence is quite as much and quite as fairly used as a weapon in the hands of its detractors, and even its friends, as ever it was. If anything, I believe modern silver prints are, on the whole, less permanent than old ones. The reason is understood by most who have had experience in the matter, and is, I think, fairly attributed to the more delicate negatives and less concentrated solutions used now than formerly, especially the thinness of the negatives. There seem to be a few well-ascertained causes of deterioration of silver prints, scarcely any of which are irremediable. They are—1. Very rapid printing from thin negatives. 2. Imperfect fixation, including imperfect removal of the salts formed by the process. 3. Insufficient washing or bad quality of the paper. With regard to the first reason—"quick printing from thin negatives"—the remedy is obvious. With regard to the second, which is by far the most serious fault of any, the remedy, though obvious, is not so easily applied, perfect removal of the unstable matter from the paper being somewhat troublesome to thoroughly effect. This arises in a measure from having uncertain quantities to deal with, the methods of procedure not being varied accordingly. A plan that will answer with one sample of paper at one time will at another, with a different paper, fail. The temparature, also, at which the process is worked has a considerable influence upon the results.

The following conditions, I am inclined to think, form a rough outline of causes of failure:—An exhausted or a too weak solution of hyposulphite of soda. This may be brought about by attempting to fix too many prints in one quantity of solution, or owing to the hypo. having lost some of its solvent power by being kept in solution, and exposed to light, or by the crystals being kept in a moist state; by the salt itself being impure or containing a large percentage of sulphate, or the silver salts formed by the action of the hyposulphite not being thoroughly removed from the paper by rapid and effectual washing. I have found by actual experiment that if the hypo., after having effected the solution and alteration of the salts of silver, is well washed out of the prints, fresh hyposulphite—say a twenty per cent. solution—applied to and left in the prints, and dried in the usual way, has no effect whatever on their permanence—an experiment anyone can make. This, I am aware, runs counter to the general opinion, as it includes the mounting of prints on boards containing hyposulphite, which is supposed to affect their permanence. I attribute the deleterious effects of such mounts to something else than hyposulphite—probably chlorine.

That a strong, hot solution of hyposulphite will effectually fade a silver print there is no doubt whatever, but the cases are not parallel. We might with as good reason say because strong nitric acid applied to the skin will blister it, very dilute nitric acid will do the same, only more slowly. This we know is not the case. Therefore, because under certain conditions hyposulphite of soda will be injurious, under different conditions there is no reason to look upon it as prejudicial to the degree it is generally represented. Like many other substances, the effect depends upon how it is applied. Bad quality of paper will cause a degradation of the tones, and a yellowing of the whites, but will not cause fading in the true meaning of the word.

There seems to be some amount of confusion with regard to the term "fading," which is applied indiscriminately to silver prints that have become defective from various causes, when it should rightly be confined to those prints in which the shadows have become less deep than when they were made. With numbers of photographic printers a sort of rule-of-thumb holds good—a certain quantity of hypo. in the fixing-bath, a certain time for the prints to remain therein, without any other variation, so that they are turned over occasionally, and no consideration for kind of paper used or the number of prints to be fixed. The routine is the same, winter and summer, and, like the law of the Medes and Persians, which altered not (or had not used to), the consequence is irregular results. Probably the first prints put into the bath are all right, but the subsequent additions are not so; hence some fading and some remaining good. These causes operating on different parts of degrees of substantiality, so to say—prints from strong or hard negatives, and those from delicate or weak ones—are quite sufficient to account for the different degrees of permanence. This, in fact, procured for silver printing the unenviable notoriety of being a fugitive process. In addition to these causes of failure, printing for many years was looked upon as merely an unimportant mechanical process, to perform which almost anybody was good enough.

I have as yet said nothing about toning as an influence to the preservation of silver prints. That it exercises a good effect to this end there is no doubt; but that it is absolutely necessary is doubtful. That the prints which have been toned in the old hypo. and gold bath have remained in good condition up to the present time, we have proof here to-night; but whether in some instances the toning resulted from the action of gold or sulphur, we are not so absolutely certain. Possibly, if after the toning the proofs had been subjected to a fresh hypo. bath, the result might have been much better. In our present methods of working with the alkaline gold bath we certainly do get a deposit of gold on the image, and the colour resulting therefrom is pleasant to look upon. Basing our opinion on the respective quali-

tics of the two metals (gold and silver) to resist atmospheric influences, the superior permanency must be accorded to gold. This, with the decided improvement in the appearance of the picture, will, no doubt, cause us to retain the use of the gold toning bath so long as silver printing continues to be the process in general use.

It may be asked, what is an old photograph? In my own mind I have fixed the date at any time anterior to fifteen years.

I feel quite satisfied that it is carelessness or want of the necessary chemical knowledge on the part of the photographer which has induced the idea that silver prints are not to be trusted in matters of permanence.

One conclusion we cannot fail to draw from this examination of good old photographs, and that is—they were in every way equal in manipulative qualities to very many of the modern ones; and also that old photographs have proved that silver printing, *when it is properly done*, is a permanent process, and not one of those evanescent, fugitive, unreliable methods of picture-making with which it is so unfairly credited. The older specimens of silver printing have been from negatives developed with acid pyro, or from negatives produced by the "converting process," as it used to be called; that is, a positive was taken, treated with a solution of sodium and mercury, which had the effect of increasing the density and destroying the positive appearance by reflected light it had originally possessed. The results were generally harsh and deficient in half-tone, the shadows being represented by clear glass, and consequently printed with the well-known "soot and whitewash" effect.

It was some time before the general run of photographers discovered that increase in exposure was nearly all that was required to make a sufficiently-dense image at one operation. The elaborate performance of making a negative bath that often as not ended in fog and stains deterred many from "going in" for direct negatives. Saving residues had not become generally known, and a bath that would not work satisfactorily was incontinently shot down the sink. This, with the high price of silver nitrate, acted as a considerable check to experimentalists, and the more certain, if worse, way of proceeding was for a long time the adopted process.

I have endeavoured to collect a few specimens of early work to show you to-night, and in criticising them you must forget for the time the beautiful and artistic work of the present day, and only think of them as good examples of the general work of that time. Where possible, the history of the production is written on the back; but with many of the specimens their age is their only history. In calling your attention to the transparencies by Ferrier, that I have had in my possession for more than twenty-five years, I think they compare favourably in every respect with work of the present day. The price then at Messrs. Horne and Thornwaite's was 12s. 6d. each. They have retained their brilliancy and colour unchanged, although they have been kept in both damp and dry rooms, with no other care than being placed in a grooved box. I may also mention that some of the prints shown have been for some years stored in a portfolio in a very damp room—so much so that they were quite mouldy—and with this result the mounts have suffered, but the prints themselves have not. In one case the print had been laid down on India paper or plate paper; the plate paper had become covered with mildew spots, but not one appears on the India paper, nor is the photograph at all affected. I may remark that on looking through a number of mounted photographs I did not find one instance of fading where the prints had been laid down on India paper, but when attached to ordinary white mounts some had commenced to yellow at the edges. A great number of my prints I had used to mount at home, using gum arabic, and they have stood the test of damp without showing any sign of deterioration. Others have been mounted by professional mounters, and I am unable to say what substance they used; at any rate, it has not affected the prints.

HALATION.

BY J. K. TULLOCH, M. D.*

Not being able to see in what way Mr. Geddes could reduce halation by placing a blackened card behind the sensitive plate during exposure, I nevertheless thought it only right to make a trial of the plan before coming to a conclusion in the matter. One little experiment led to another, and I will briefly state the results at which I arrived.

I have here a simple, non-achromatic lens of bi-convex form. If you catch the reflection of a bright object (such as a jet of gas) upon it you will find that there are two images to be seen—first, an erect image from the front surface of the lens; and, second, an *inverted* image from the back surface of the lens. A piece of ordinary glass would have done just as well, but the curves of the lens giving an erect image from the front and an inverted image from the back allows the back image to be at once recognized.

One quarter of the back surface I have covered with carbon tissue *in optical contact with it*. Another quarter I have covered with a backing of starch and "deep orange chrome;" the rest of the back surface is uncovered.

Now, you will find if you stand so as to catch the *inverted* image upon the uncovered part, that this back reflection is almost as powerful as the erect image thrown out by the front surface. Turn the lens in your hand so as to bring the *inverted* image upon the orange backing, and you will now find the back reflection is only half as powerful as it was. Turn the lens further and bring the *inverted* image upon the carbon tissue, and you will find that it has all but vanished. Once more bring the inverted image upon the uncovered part of the back surface, and while there place behind and in contact with the glass a blackened card. You will find this has not the slightest effect upon the back reflection.

From this demonstration I conclude that carbon tissue is a better backing than the orange chrome, and that the blackened card has no effect in reducing back reflection. Actual experiment with the camera confirmed these conclusions, the orange chrome giving slightly better results than might have been expected, but in no way equal to the backing of carbon tissue.

That halation is not entirely cured by backing the plate, even with carbon tissue, may be due either to the fact that the back reflection is not entirely obliterated by the backing, or that other causes are to be found for what is not explained by this cause.

If you examine the inverted image reflected from the surface of the lens backed by tissue you will find that it is very faint; and, since in actual practice the light is still further reduced by first having to penetrate the film, it is reasonable to suppose that any little light reflected from such a backing can be very weak indeed.

From these and one or two other experiments I conclude there are other causes at work; and, stating what appears to me to be the chief causes of halation in order of importance, I would place:—First, reflection from the back of the plate (not entirely obliterated by any backing). Second, reflection from the illuminated particles of bromide of silver acting upon adjacent particles. Third, reflection from particles of dust floating in the camera in the vicinity of the plate, as can be proved by filling the camera with dust and exposing a properly-backed plate. Fourth, a certain chemical condition of the plate—halation being often very pronounced where the physical conditions seemed to be entirely against its production.

* Read before the Dundee and East of Scotland Photographic Association.

Correspondence.

OPTICS FOR PHOTOGRAPHERS.

Dear Sir,—In reading Mr. Wheeler's able criticism on what I said about distortion, I have marked that the main point in which he differs from me is, that he takes the stop as the principal part of lens, and that the rays coming through it are controlled by the object-glass. On the other hand, I have taken all my calculations from the *fixed* point, the optical centre of the lens, and the stop used as subsidiary to the lens itself. I prefer my way of looking at the matter, as all calculations ought to be made from some immovable point. At the same time, it must be admitted that there is much to say on Mr. Wheeler's point of view. I have to thank him for the courteous way in which he has given his criticism, and for his kindly remarks on other portions of the lessons which have appeared.—Yours faithfully, W. de W. Abney.

Proceedings of Societies.

The Photographic Society of Great Britain.

The ordinary meeting of this Society was held on Tuesday, the 11th inst., at the Gallery, 5A, Pall Mall, East, Mr. Jas. Glaisher F.R.S., president, in the chair.

Mr. G. Murray was elected a member of the Society.

The Chairman read a communication from Dr. Eder, expressive of the feelings of joy and honour he felt on finding he was the recipient of the Society's "Silver Progress Medal," an award which would inspire him to further research.

Captain Abney, R.E., F.R.S., read a paper entitled "Illumination of the Dark-room, and some Optical Experiments." Capt. Abney commenced by referring to the early experiments by Daguerre, Claudet, and others, to obviate working in the dark as at first practised. Claudet, in 1854, after numerous experiments, was the first to give preference to red light. He (Capt. Abney) thought it was pretty well settled, from repeated experiments, that red light was the safest to employ, both photographically and spectroscopically. He had examined all the various media from time to time recommended, and could obtain a photograph of any of them. At a recent technical meeting, he showed the results obtained through a paper resembling canary medium, made by dipping the paper into an acetate of lead solution, and afterwards into chromate of potash; the results were not so good as with orange paper. Some plates coated with gelatine containing chromate of lead were shown, an image being obtained in two minutes. Examples of these were shown in a candle lantern, the intensities being said to be about the same. The third side of the lamp was glazed with red stained glass. Capt. Abney also made photometric tests of each light to obtain the relative intensity of illuminating power. These were repeated by Mr. C. Ray Woods and Mr. James Cadett. The results of the three observers gave a mean intensity of Canary medium, 1; orange paper, 1·86; stained red glass, 4·9. Another method was tried, viz., that of placing printed matter at a distance from each light; but less importance was attached to that method. Other experiments were detailed, in which exposures were made through orange glass covered with one thickness of orange paper, an image being obtained; whereas no image was obtained through red glass, Captain Abney saying that when he said stained red, he did not mean a stain of an orange colour. The spectra of various glass media obtained by electric and gas light was projected on the screen, and were numbered in the following order:—1, chromate of lead in gelatine; 2, orange; 3, stained red; 4, ruby; 5, green; 6 green and chromate of lead; 7, green and orange. Nos. 1 and 2 allowed a good deal of violet to pass. Nos. 5, 6, and 7 permitted the greater part of the green to pass. A series taken with candle light were also shown, comprising chromate of lead as before, stained red, orange flashed on ruby, green and ruby, cobalt and ruby. These exposures were of one minute duration through strips $\frac{1}{100}$ of an inch broad, spread out in the spectrum four inches in length. From his experiments Captain Abney concluded that green glass is not to be recommended, as it allows the green to pass, and otherwise cuts off the luminous rays of light. A sample of canary medium sent him by Mr. Scorah was very good, better than chromate of lead. Personally, he was unbiassed; but he should not care to expose a rapid plate very long to its influence. No light could be said to be absolutely safe; the point is to use that which is found to be the safest.

Mr. W. E. Debenham said Captain Abney states the point which light is the most suitable as settled. Before proceeding I shall be glad to see some of the orange paper said to give more light than the more obstructive canary medium. The results expressed in Captain Abney's paper are so contrary to my own experience, and that of several other experimenters, as to be worthy of repetition. My own experience has been that canary medium stops more photographic power than orange paper, ruby on pot metal, or cherry fabric. Canary medium is better than either of these. After repeated trials for my dark-room, yellowish-green glass and yellow paper proved the best. Supposing three media, red, orange, and yellow, to all have the same photographic power, then the one having the greatest visual power should be selected. When Mr. Cowan exhibited his lamps at another Society, and placed the green glass half down, some could not see any difference between that portion and several thicknesses of orange. He (Mr. Debenham) did not rely on spectroscopic experiments, for there was a divergence of opinion between those who made it a study.

Mr. C. Ray Woods had made comparative experiments with canary medium and orange paper; one-half the plate was covered with the former, and the other half with the latter; after exposure to daylight there appeared very little difference. The green glass employed by Captain Abney was not the cathedral green used by Mr. Debenham, but a better green for the purpose. He (Mr. Woods) had seen Mr. Debenham's lamp, and did not think the green glass was much use; the safety consisted in the yellow. Examining Mr. Cowan's lamp with the spectroscope, he found that some blue and green passed through; he can photograph the D line, but cannot get red without much longer exposure. Instead of using red, photographers adopted ruby for cheapness. He did not think the red light of the dark-room as injurious as represented.

Mr. J. Spiller recommended the use of a resinous varnish, such as aurine, which freely dissolves in alcohol. If this varnish is spread over glass it is convenient for obstructing rays which would otherwise go through; a resinous varnish being more satisfactory from a physical point of view, being a true varnish all through alike.

Mr. Cowan said the results of his experiments with canary medium were against Captain Abney. A very rapid plate exposed over twenty minutes, and afterwards in the camera, showed no trace of fog; therefore, it was safe enough to work with plates of ordinary rapidity. Regarding cathedral and orange, he thought it was a very good combination; he had prepared plates with it free from fog; but he laid no stress on the green, any further than giving a colder light.

Mr. Debenham, referring to Mr. Woods' remarks on cathedral green, said there is no green glass of that name. Mr. Woods spoke of his lamp as being unsafe; an exposure of fifteen minutes resulted in no image, whereas five minutes through ruby glass gave an image.

Mr. H. B. Berkeley said that Mr. H. Cooper, in 1877, recommended green glass for collodio-bromide work.

Mr. F. Ince agreed with Mr. Woods; the injury to eyesight was less from the red colour than going from the dark-room into the light. The use of tinted spectacles in the dark-room might be attended with advantage.

The Chairman said it was evident that a light which would affect some sights would not interfere with others. Perhaps Mr. Ackland would say a few words regarding the effect of the dark-room light on the eyesight?

Mr. W. Ackland should like the subject of colour-blindness to be examined more critically, it being a subject engaging a deal of attention now. Ruby light is decidedly and emphatically injurious to the sight, and he noticed among photographers how their sight was becoming more changed through the dim light of the dark-room. He found the comfort of changing the light in his own dark-room, and induced others to do the same.

Mr. W. S. Bird doubted, after the contradictory scientific evidence, whether the chemistry of the spectrum was as well studied as it should be. It was known that there was a prevalence of blindness among horses kept in dark stables, and he considered the transition from dark to light hurtful.

Captain Abney, replying to the discussion, said he should like Mr. Ackland to definitely state the action of red light on the ciliary muscles. Referring to Mr. Spiller's suggestion to use aurine, he found it excellent; but if not thick enough, it allowed a little blue to pass. In combination with yellow it would be safe. Replying to Mr. Bird, he said the chemical spectrum is well understood. Looking at a white object through orange, white can be distinguished; through red, it cannot. Stained red is as safe as anything possible, only it is necessary to use any light with care.

A vote of thanks to Captain Abney having been passed,

The Chairman announced that the next ordinary meeting, on April 8th, will be devoted to an exhibition of lantern slides by means of the Society's oxy-hydrogen lantern.

South London Photographic Society.

The ordinary meeting of this Society was held on Thursday, the 6th inst., at the House of the Society of Arts, John Street, Adelphi, W.C., the Rev. F. F. Statham, M.A., President, in the chair.

It was announced that a letter had been received from Mr. Macbeth, declaring Mr. Bridge's "River Scene" to be the picture selected as possessing the greatest amount of artistic merit.

The chairman further said that the committee had decided to preserve the competition pictures in a suitable album, and the artist's decision thereon. It would calculate to bring photographers' works to an ideal standard, by comparison with those pictures whose merit to the title was fully admitted. As it happened now, half-a-dozen persons taking the same view obtained different results.

On the motion of the Chairman, a vote of thanks was accorded to Mr. Macbeth.

A question from Mr. F. A. Bridge was next considered:—"What are the results obtained with the canary medium?"

The Chairman said Mr. Bridge distributed several sample sheets at the last meeting; he should like to hear from anyone who had tried it.

Mr. A. Cowan, in company with Mr. W. Cobb, had made some experiments with canary medium, about two hundred square inches of it illuminated by a batswing burner forming the source of light. Rapid plates exposed at a distance of six feet for twenty-two minutes did not produce fog, although there was sufficient light to read on the walls of the room. He considered one thickness in front of a gas jet would permit the most rapid commercial plate being exposed for thirty seconds at a distance of nine inches without any fear of fog.

Mr. E. Dunmore enquired if the batswing burner was shielded.

Mr. Cowan replied that the naked flame of a large size burner was employed.

Mr. E. Dunmore then read a paper entitled "Old Photographs" (page 169), and supplemented it with a large number of silver prints prepared within the last twenty-five years; he also showed some transparencies by Ferrier, which had been in his possession a quarter of a century. It was noticeable that some of the prints which were mounted on India-tinted boards had not faded, whereas those on white mounts had; also some mounted with gum were perfect, while others sent out to be mounted were not. A packet of old photographs sent by Mr. H. P. Robinson was handed round, the particulars of preparation being attached to each.

The Chairman said the subject under discussion was one likely to be very useful. When speaking of old photographs one is apt to forget the limited time photography has been in existence. Variety of treatment was especially desirable to study, and for this reason he brought some specimens by various processes. There were some by Mr. Johnston, his early productions in carbon; some of Mr. Rejlander's art studies, printed in silver; also specimens of wax paper prints, and some Collotype work produced by Mr. Griggs. He was informed there were several packages to be shown, therefore each exhibitor's prints would be passed round separately, and he would now ask for a vote of thanks to Mr. Dunmore for his able paper.

This having been accorded,

Mr. E. W. Foxlee said he had some prints to show, but they were not in such good preservation as Mr. Dunmore's. They were very good until a couple of years ago; since then, they had suffered somewhat through being in a damp atmosphere. One of the examples on salt paper, he believed, was prepared in 1854, and toned in the sel d'or bath. Another, in favour of the theory requiring the employment of vigorous negatives, was a stereoscopic picture, one-half of which had evidently been protected in printing, through being thinner than the other; this portion had faded, the other had not. Other specimens produced within the following four or five years, toned with hypo and gold, and mounted with gum, were in a good state of preservation. A print bearing the date of 1862 was good, although the mount was mildewed, and another (1865), waxed, had faded. It was curious that fading commenced at the edges, even in unmounted prints.

Mr. F. York showed prints bearing dates as far back as 1856; one specimen (1863), mounted over a smaller photograph, showed fading more perceptibly where the margins were in contact with the cardboard.

The Chairman said he should be glad to hear from Mr. Thos. Parkinson (Vice-president of the Bolton Society), whom they were glad to welcome.

Mr. Parkinson said his experience in silver printing dated back to 1853, and he found the prints produced in the sel d'or bath were as good as any produced by other means since.

Mr. W. M. Ayres had prints made in 1851. He also passed round some very fine unmounted prints made fifteen and twenty-two years ago respectively. He said it had been observed that prints mounted in contact with glass faded quickly. If a neutral solution of isinglass were employed, the prints would be permanent.

Mr. F. Howard had noticed fading at the edges, particularly in books kept in an apartment where there was no fire. The atmospheric influence commenced where the least protection was offered. If pictures were carefully framed and kept in a dry atmosphere, fading would not be so general.

Mr. W. M. Ashman observed that burnished prints in cut-out mounts, exposed out of doors in show-cases, lose their brilliancy in a very short time, the exposed parts being robbed of the surface; but not so the portions covered by the mounts. Many of the specimens shown were almost devoid of surface.

Mr. Foxlee attributed the loss of surface in Mr. Ashman's case to the continued action of moisture on the highly glazed surface. The prints shown (1856) were very slightly albumenized; pure albumen was rarely used in those days.

The adjourned discussion on the permanency of ready-sensitive paper was then resumed.

Mr. York could not see how it could be any less permanent than ordinary freshly sensitized paper is. Citric acid is generally used, and the citric acid is neutralized with carbonate of soda in the final wash before toning. He desired to call attention to the importance of this final wash, even with ordinary paper, as it tended to neutralize any trace of acid there might be in the paper or fixing solution, which latter was not always neutral. In reference to Mr. Dunmore's paper, many years ago he experimented with other nitrates and obtained identical prints on a 60-grain plain silver solution, and another of 30 grains with the addition of 30 grains of nitrate of soda; as the prints aged, those from the latter bath gradually bleached, therefore it shows the importance of using a silver bath strong enough to obtain permanence. Low sensitizing solutions are more liable to dissolve albumen. Mr. Dunmore says hypo deteriorates in solution. He (Mr. York) had not found it to be the case; he always kept it some time before use, to equalise the temperature.

Mr. Dunmore: If the solution is kept long, sulphate is formed, which is not a good solvent, hence prints are imperfectly fixed.

Mr. York suggested that the competition pictures should be marked whether printed on ready sensitized paper, or not; as the Society intends keeping them, it will prove a valuable record.

Mr. Ayres said citric acid for preserving paper meant more gold used in toning. With one commercial sample, he used 42 grains of chloride to tone eleven sheets of paper.

Mr. Howard was able to support Mr. York in the suggestion to soak the prints in an alkali previous to toning; he employed ammonia as a neutralizer.

Mr. Ayres: You don't get such a good surface.

Mr. Parkinson did not think the results from preserved paper could be so permanent as ordinary sensitized paper; he found, as a rule, it tones quicker, and has not such a body of silver as the other has, a fact soon discovered on reference to the residue returns.

Mr. W. K. Burton did not think the question could be easily dealt with, owing to the short time preserved papers have been in use. If prints were only washed slightly, they toned quickly, and would show signs of deterioration in a couple of years; if well washed, they tone slowly, and in his opinion will not fade so quickly.

Mr. Dunmore mentioned that several prints he had shown were on preserved paper which has been before the public about fifteen years.

Mr. A. Mackie should like the term ready-sensitized more clearly defined, as there are at least six different samples before the public. Some print red, others blue, therefore they cannot all be from the same formulæ. A secret is attached to the preparation, which made it difficult to discuss the question.

The Chairman, in closing the discussion, remarked that a certain quantity of silver was required to produce good prints; on the exact amount opinions differed. It was desirable to know the margin, because there would be little use in making prints if they are not likely to be permanent.

London and Provincial Photographic Association.

At the usual weekly meeting of this Society on Thursday, the 6th inst., Mr. J. Barker occupied the chair.

Mr. Hart exhibited a dark-room lamp which showed some novelty of construction, although the principle is not new. The outside was a glass cylinder which could be of any colour the operator might choose, having a gas-jet inserted through the bottom end, which was closed, a plain glass chimney inside

covering the gas flame. The inlet of air was through a series of holes round the top or hood of lamp, which was of Japanned tin, and made light-tight; the air entering the top of the lamp passed down between the chimney and outside glass, returning upwards through the chimney supporting the flame, and passing out at top with products of combustion. The illumination was equal to 18 candles, with a consumption of 4½ cubic feet of gas per hour. Mr. Hart also said he had constructed a lamp in which he had put an asbestos cardboard lining throughout; it was arranged with three grooves in front, in which as many sheets of glass of the same or different colours could be inserted.

A dark-room lamp was also shown by Mr. J. B. B. Wellington. It was similar to one shown by Mr. A. Cowan at a previous meeting, excepting the front, which, sliding in a groove vertically, could be readily raised for admission of white light into the room, or for the exposure of transparencies. Mr. Wellington also showed some gelatine plates which had been coated with an unwashed emulsion, from which the salts crystallising out had been entirely removed with dilute hydrochloric acid.

The Chairman was of opinion that the experiment proved that the washing of an emulsion might be dispensed with.

Mr. Henderson showed an alteration made at his suggestion in one of Messrs. [illegible]e and Hare's changing boxes. Originally the number of the plate in position for exposure was seen in front through a small piece of ruby glass; as now altered, the number was seen at the side of the box, preventing any risk to the plates from the light through the glass.

Mr. Hare explained that this was not likely to occur, as the ruby glass opening did not extend beyond the width of the plate carrier.

Mr. Henderson announced that he had designed a new coating machine, and that he intended at a subsequent meeting to demonstrate its action before the members.

Manchester Photographic Society.

The ordinary meeting of the above Society was held on February 14th, John Pollitt, President, in the chair.

Messrs. Barlow, Lomas, and Hadfield were elected members.

The President referred to the relative plates exhibited at a previous meeting by Mr. Chiltern, showing insensitive marks in pictures, and said he thought the marks were caused by the precipitation of AgBr to the edges of the plates.

Mr. Atherton said he had met with similar trouble, but had traced the defect to the emulsion being short of gelatine.

Mr. Smith brought some plates showing similar markings, which, in his opinion, were caused by imperfect tenure of the decomposition salts.

Mr. Schofield contended that this explanation could not be correct, or the marks would occur all over the plate. He further stated, in support of his belief (expressed at previous meeting), that faulty drying arrangements were the cause; that he had made an arrangement in his drying-box which permitted the plates to be inspected during drying, and was confirmed in his opinion.

A somewhat lengthy discussion ensued on the same subject, Messrs. Schofield, Atherton, Chiltern, and Smith advocating their own theories.

Mr. J. W. Leigh showed a negative developer by the light of ordinary gas light screened with canary medium, and decided to adopt the illuminary medium in his dark room. Negative perfectly clean.

Mr. Richton read a paper on "Swing Backs *versus* Rising Fronts," illustrating his remarks by means of an ingenious model of a camera in section. The paper was warmly applauded.

The President expressed his pleasure, and complimented Mr. Richton on his ingenuity in designing the model. In commenting upon the opinions held by Mr. Richton, he stated that his objection to the swing backs was, that he thought that placing the plate at too great an angle to the lens axis must have a distorting effect, and showed a photograph of a rectangular figure, using swing back and then with rising front, proving by measurement that there was some distortion arising from the use of swing backs.

Mr. McKellan advocated a swing front as doing all that could be done with swing backs without any distortion.

Mr. Schofield considered that the best way was to combine the rising front and swing backs.

Mr. Watts expressed himself much pleased with Mr. Richton's paper, and moved a vote of thanks, which, seconded by Mr. Blakely, was carried.

The President suggested that as the subject had evidently excited a good deal of interest, members should study the subject before the next meeting.

Mr. Watts was asked to read a supplementary paper.

Leeds Photographic Society.

The usual monthly meeting of this Society was held on Thursday, March 6th, in the large Lecture Hall of the Leeds Philosophical and Literary Society. The Hall was well filled by the members and their friends. In the absence of the President, Mr. J. W. Ramsdens, Vice-president, took the chair.

After the transaction of a little formal business, the meeting proceeded to the election of new members, and Messrs. Law, Whitehead, Lloyd, and Professor Rucker were declared duly elected.

The Chairman then called upon Mr. Teasdale to conduct the Lantern Exhibition.

Mr. Teasdale expressed his pleasure at seeing so many members and friends present, and also at the large number of slides which had been sent in for exhibition. Lantern work was new to most of the members, but the slides which he and the Hon. Secretary had had the opportunity of examining were very good, and quite equal to those generally seen. In selecting from such a large number, preference would be given to those produced by the members, and if time allowed, the very fine slides by professional makers would be passed through. He would first call upon Mr. Pocklington, who would exhibit a number of slides illustrating the effect of the different developers.

Mr. Pocklington exhibited a number of slides taken on gelatino-bromide plates developed with such developers as ferrous oxalate and ammonia-chloride, hydrokinone, and carbonate of soda, pyro and carbonate of soda, &c.

Mr. H. Rodwell.—Slides on gelatino-bromide plates.

Mr. J. W. Ramsden.—Slides reduced from 8 by 10 negatives, some of which were taken thirty years ago. Mr. Ramsden's slides were taken on gelatino-bromide plates (own make), mostly two of the same subject to show the effect of ferrous oxalate with tartaric acid, and of pyro with pearlash.

The Hon. Secretary.—A series of slides on gelatino-bromide and gelatino-chloride plates (own make), showing on both bromide and chloride plates the difference in tone, varying from blue-black to red, that could be obtained by variations in the exposure and development.

Mr. Ridson.—Transparencies on gelatino-bromide (Ramsden's) plates.

Mr. W. Denham.—A number of very fine transparencies on Nelson's and Cowan's plates.

Mr. Thomson.—Instantaneous view of tramway car.

Mr. W. Teasdale.—Transparencies on gelatino-bromide plates, and also on plates by Chapman, England, Cowan, &c. Mr. Teasdale also exhibited transparencies of Muybridge's animals in motion, and a very fine selection of slides by the Woodbury process.

Mr. J. W. Reffitt.—Some very fine instantaneous views of Swan's "Boy Sailing Ship," &c., and a number of Continent slides.

The lanterns, oxyhydrogen, fitted with Dallmeyer's lenses, were lent by Messrs. Reynolds and Branson, and manipulated by Mr. White, a member of the Society.

Dundee and East of Scotland Photographic Association.

The sixth regular monthly meeting of this Society was held in "Lamb's Hotel," Reform Street, on Thursday, the 6th inst. Mr. J. C. Cox occupied the chair.

The minutes having been read and approved,

Dr. Tulloch then proceeded to make some remarks on "Halation" (see page 171). A lively discussion followed, and the Doctor promised to extend his experiments, and give some more particulars at next meeting.

The adjourned discussion on Dr. Tulloch's previous paper, "Shortcomings of Photography," was then resumed, and a very animated discussion ensued.

The nomination of office-bearers for the ensuing season was then proceeded with, and it was arranged to ballot the names at next meeting.

The question-box contained the query, "Whether is collodion or varnish the better protector of gelatine plates?" The enquirer was recommended to use a coating of each, applying the collodion first, and the varnish above it.

The subject for next monthly meeting was announced as "Still Life."

It was arranged to hold a competition for lantern slides in a fortnight, each member to send only three slides for competition, although at liberty to send as many as he liked for exhibition.

Mr. Macdougald exhibited his new "Instantaneous Lantern Slide Carrier," which, by a simple but ingenious arrangement, instantly substitutes one slide for another.

A vote of thanks to the chairman brought the meeting to a close.

Bolton Photographic Society.

The usual monthly meeting of this Society was held on Tuesday last, when there was a very fair attendance.

It was decided that the third annual open meeting be held in April next, and the evening was spent in discussing the arrangements.

Owing to the unavoidable absence of Mr. R. Harwood, the usual lantern exhibition was not given.

Mr. Heaton was duly elected a member.

Sheffield Photographic Society.

The usual monthly meeting of the above Society was held in the Masonic Hall on Tuesday, the 4th inst., under the presidency of Mr. J. H. Rawson.

There was a very large attendance.

The subject of "Lantern Slide Making" was introduced by Mr. W. B. Hatfield, who exposed and developed several plates at the meeting, and succeeded in producing by contact printing, by gas and candle light, several good transparencies on Chapman's gelatino-albumen plates. He also exhibited a variety of slides made both by contact printing and through the camera.

Mr. J. Turner also exhibited some excellent slides made on ordinary gelatine plates, developed with alkaline pyro.

Mr. W. Dakin brought a brilliant transparency developed with pyro, and gave very practical arguments in support of the ordinary pyro developer being all that was necessary to produce perfect transparencies, and also suggested that the use of the alum, acid, and iron clearing and intensifying solutions was very valuable in slide making.

Mr. Ainley also gave some useful hints in the exposing of transparencies, and argued that a long exposure to weak light gave much better results than a short exposure to a strong light. Many other members also took part in the discussion.

Mr. Dickenson brought an excellent burnisher of his own make, which was highly commended for its style and also its cheapness.

Messrs. Wellington and Walker were elected members of the Society.

After further discussion and announcements relating to the monthly competition, a most interesting and practical meeting was brought to a close.

North Staffordshire Photographic Association.

The monthly meeting was held on Wednesday, March 5th, at Hanley.

The Chairman (Mr. Alfieri) exhibited an instantaneous shutter for a stereoscopic camera of his own manufacture, made to work behind the lenses; and also some home-made dark slides, each, by an ingenious contrivance, being made to hold four quarter-plates which could be exposed in succession.

On Wednesday, March 12th, at the Chairman's invitation, the members met in a large room at his residence (Northwood), where a good lantern and laboratory being kindly placed at the disposal of the members, Mr. Alfieri proceeded to give a demonstration of a method of enlarging upon the argentic bromide paper and opals manufactured by Messrs. Goodall and Steven, of Glasgow. Several enlargements were successfully made from half and quarter-plate negatives, a large three-wick burner being used. The exposures given varied from one to three minutes, the resulting positives being developed with Audra's modification of the ferrous-oxalate developer. The resulting pictures were unanimously admired, especially a viguetted enlargement on opal from a negative of a child's head, taken by Mr. Allison. Six enlargements having been made without a failure in any case, the Chairman was congratulated upon his skill, all the pictures being remarkable for the great purity preserved in the whites, and freedom from defects.

A vote of thanks having, on the proposition of Mr. F. J. Emery, seconded by Mr. Burgess, been passed to the demonstrator for his kindness, it was resolved to engage a suitable room in Hanley for the purpose of giving demonstrations, and storing apparatus, &c.

The Hon. Secretary offered the use of his studio and dark-room to the members during the summer season.

After some interesting conversation upon various technical topics, and again thanking Mr. Alfieri, the meeting separated.

Talk in the Studio.

An Interesting Mode of Making a Photographic Relief.—Mr. Francis Cobb informs us that having given a gelatino-chloride plate an insufficient exposure, and having failed to obtain an image with the citro-oxalate of iron developer, he poured hot water upon the film, and immediately a relief appeared, showing all details of the original subject. This would have been, he tells us, well suited as an original for making a printing block by moulding. The specially interesting point is the circumstance that only a very short exposure was given—insufficient, indeed, for the production of a picture by the usual method of development. Our readers will remember the experiments of Mr. Warnerke, and others, as regards the production of reliefs on gelatino-bromide films.

Universal Attraction in its Relation to the Chemical Elements.—This is the title of a small manual by Mr. W. H. Sharp, Livingstone, Edinburgh. The importance of thoroughly reviewing the Newtonian philosophy by the light of modern discoveries is insisted on, and an attempt is made to correlate all the forms of force to gravitation. The tendency of modern research is now to accurately measure force or energy, and doubtless the next great step in chemistry is to devise a system of notation by which the dynamics of a reaction can be expressed as accurately as the gravimetrical changes are indicated by the usual chemical equations. Much thought and labour must, however, be expended before this stage can be arrived at.

Pirated Photographs.—At the Guildhall Police Court, Samuel Rosenthal was summoned by Mr. Marcus Bourne Huish, the Secretary of the Fine Arts Society, Limited, for offering for sale a photographed copy of a painting called "The Return from the Battle of Inkerman," of which they were the proprietors of the copyright. He was also summoned by Mr. Benjamin Brooks, publisher, for a similar offence with regard to two pictures of which he held the copyright, one of which was called "Which do you like?" and the other "Can't you talk?" The publishers had been communicated with, and wished to press the case. The defendant did not offer them for sale in witness's presence to anyone but himself and partner, It seemed that some man had induced defendant to sell the photographs on certain conditions. Sir T. S. Owden said the defendant could be fined £10 on each summons, or go to gaol. Mr. Hnish said the Society had no wish to be hard with him, but he belonged to a class that sold those pirated copies, and they were very much on the increase. If they could be sure that the defendant would come up when required to give evidence in other cases that would come on, they would ask that he should be very leniently dealt with. In the result, Sir Thomas S. Owden fined the defendant 10s. and costs on summons, or five days' imprisonment on each, the terms each to be consecutive.

Photographic Club.—At the next meeting of this Club on March 19th, the subject for discussion will be, "On Portraiture in Ordinary Rooms.

To Correspondents.

*** We cannot undertake to return rejected communications.

F. Greaves.—Thin glue will answer, but both the parchment and the photograph should be moistened.

Constant Subscriber.—1. You should not use oxalic acid, but if you well mop the brass-work with methylated spirit, the lacquer will be softened, and you will be able to remove all dirt with a soft leather and rotten-stone. 2. Probably not much; even if genuine, it is not likely to be worth two pounds.

W. M.—1. Yes, an exceedingly good and very sensitive emulsion. 2. Two hundred and fifty grains is the right quantity to use. We should prefer the kind last mentioned. 3. It depends on the amount of acidity, but something under half-a-dozen drops should suffice in any case. 4. To each separate solution, just before boiling. Let us know how you succeed with the process.

W. M. Phillips.—Both the numbers to which you refer, and the Year-Book for 1883, are out of print. To repeat all the details you require would occupy too much space.

R. A.—You had better use four cells of bichromate battery, and a small Swan lamp (five-candle). The outfit would cost, perhaps, 25s. or 28s., and we imagine that about threepence an hour would cover the cost of working.

BETA.—1. In such a case a salary might be expected at once; but we do not think it is usual to include board and lodgings.

AMATEUR.—See the "Formulary" in this week's NEWS.

DR. R. DAWSON.—A misprint, and should simply be "gelatine."

A. H.—1. The focus of such a lens as you refer to may be determined with sufficient accuracy by adjusting it until a distant object is in focus, and then measuring the distance from the diaphragm to the ground glass. Look in the vertical column on the left-hand side of the table for the figure corresponding to the focal length, and for the figure corresponding to the diameter of each stop in the top row. In the body of the table, and at the point of intersection between the horizontal row commenced by the figure expressing the focal length, and the vertical column headed by the diameter of the stop, you will find a figure, which must be inscribed upon the stop. Each stop of the series must be marked with a figure obtained in this way, and the series of figures will represent the relative exposures required with the stops respectively. If then you know (by experience) the exposure required with one stop, you can very easily calculate that which will be wanted with the other. For example, you have stops marked f/8, 5, 10, 5, 1, and ·75, and you have found that under certain conditions the third of the series requires two seconds. The exposures will then be as follows: twenty seconds, five seconds, two seconds, one second, ·2 of a second, and ·15 of a second. 2. We shall be pleased to do so. 3. You will find the addresses of several makers in our advertising columns.

S. R. J.—1. It can be obtained from any glass merchant. 2. Thick gum with ten drops of carbolic acid to each ounce.

S. C. RILEY.—Thank you for the prints, which we think show great promise. We will write to you privately.

E. D.—Certainly.

W. E. C.—1. It will unswer perfectly well. 2. Under ordinary circumstances it should keep for several months if treated as you propose. 3. It is very good, but we prefer to use phenol or carbolic acid. Add it in the same proportion as is recommended for the salicylic acid. 4. We do not know exactly what the advantages are; indeed, we have never been able to find that any exist.

A. GRENIER.—The ammonia method, as described in Eder's "Modern Dry Plates," will give you excellent results if you follow the directions exactly. The book is published at our office.

T. S. S.—We noticed the pictures you refer to, and believe they were enlargements on a kind of Calotype (or Talbotype) paper.

SOL.—1. You will find particulars on page 246 of Pritchard's "Studios of Europe." 2. You can manage it if you give a sufficiently long exposure. Probably, more than an hour would be required.

WILLIAM TAYLOR.—1. Yes, quite practicable; but you must not expect to obtain the best possible results until you have devoted some time to working up the details of the process. 2. Certainly. 3. You must prepare them yourself. 4. Yes.

AMATEUR.—1. Your negatives are evidently far too thin. Probably you over-expose. 2. It appears to us that you have contaminated your toning bath with hypo.

A. A.—Thank you for the parsgraph, which interests us very much.

H. S.—We cannot tell you the address of the gentleman you mention, but you can obtain what you require from Dr. Liesegang, of Dusseldorf.

J. R. JONES.—You will find all you require in "Pritchard's "Photography and Photographers," and Abney's "Instruction." Both of these are published at our office.

EBBW VALE.—You can obtain it to order from Marion and Co.

The Photographic News Registry.

Employment Wanted.

Retoucher (Lady), London preferred.—M. A., *Photo. News* Office.
Assistant in Reception Room, &c.—F. S., 58, Belsize-rd., S. Hampstead.
Colourist and Retoucher (Lady).—Theta, *Photo. News* Office.
Photo-zinco. or Photo-lithog.—E. Beck, 7, Fowell-st., Lancaster-rd., W.
Assistant Operator and Retoucher.—Alpha, *Photo. News* Office.
Retoucher & Assist. Op.—H. Joyce, Sandown-villas, Fisherton, Salisbury.
Operator, wet and dry.—J. H., 38, Lansdown-rd., Dalston.
Assist. Operator & Retoucher.—T. H., 58, Campden-st., Campden-hill, W.
Retoucher (Lady).—Otto Pfenninger, St. Gall., Switzerland.

Employment Offered.

Printer and Toner.—E. W. Lavender, Tweedy Buildings, Bromley, Kent.
Photo-lithographer.—Riddle and Couchman, 22, Southwark-bridge-rd., S.E.
Operator & Retoucher. exp.—Personally to W. Phillips, 304, Regent-st., W.

"THE WHITTAKER OF THE PHOTOGRAPHER."
—*Chemical News.*

THE YEAR-BOOK OF PHOTOGRAPHY AND PHOTOGRAPHIC NEWS ALMANAC for 1884. Edited by H. BADEN PRITCHARD, F.C.S. Price 1s., per post 1s. 3d.—PIPER & CARTER, 5, Castle Street, Holborn, London, E.C.

THE EVERY-DAY FORMULARY.

THE GELATINO-BROMIDE PROCESS.

Emulsion.—A—Nit. silver 100 grains, dist. water 2 oz. B—Bromide potassium 85 grains, Nelson's No. 1 gelatine 20 grains, dist. water 1½ oz., a one per cent. mixture of hydrochloric acid and water 50 minims. C—Iodide potassium 8 grains, dist. water ½ oz. D—Hard gelatine 120 grains, water several oz. When the gelatine is thoroughly soaked, let all possible water be poured off D. A and B are now heated to about 120° Fahr., after which B is gradually added to A with constant agitation; C is then added. Heat in water bath for half an hour, and stir in D. After washing add ¾ oz. alcohol.

Pyro. Developer.—No. 1—Strong liq. ammonia 1½ oz., bromide potassium 240 grains, water 80 oz. No. 2—Pyro. 30 grains, water 10 oz. In case of an ordinary exposure mix equal vol.

Iron Developer.—Potassium oxalate sol. (1 and 4) 80 parts, ferrous sulphate sol. (1 and 4) 20 parts, dist. water 20 parts. To each 4 oz. of the mixed developer add from 5 to 30 drops ten per cent. sol. potassium bromide, and 30 drops sol. sodium hyposulphite (1 and 200).

Substratum or Preliminary Preparation.—Soluble silicate of soda 1 part, white of egg 5 parts, water 60 parts. Beat to froth and filter.

Fixing.—Sat. sol. of sod. hypo. 1 pint, sat. sol. of alum 2 pints, mixed.

Cowell's Clearing Solution.—Alum 1 part, citric acid 2 parts, water 10 parts. Edwards makes this sherry coloured with perchloride iron.

Eder's Method of Intensification.—The negative is whitened by soaking in sat. sol. of mercuric chloride, and after thorough rinsing immersed in potass. cyan. 10 parts, potass. iod. 5 parts, mercuric chloride 5 parts, water 2,000 parts. As film becomes dark brown, the actinic opacity is increased; but prolonged action causes brown tint to become lighter, until at last the negative is no denser than at first.

Fol's Backing Sheets.—A chromographic paste is prepared with gelatine 1 part, water 2 parts, glycerine 1 part, and a very small addition of Indian ink. Strong paper or shirting is coated, and the sheets are laid, face downward, on waxed glass to set. Press to back of glass plate.

THE WET COLLODION PROCESS.

The Nitrate Bath.—Water 14 oz., nit. silver 1 oz., nitric acid 1 drop. Before using coat a small plate, and immerse it for 20 minutes.

Cleaning Preparation for New Plates.—Alcohol 4 oz., Jeweller's rouge ½-oz., liquid ammonia ½-oz.

Film-removing Pickle for Old Plates.—Water 1 pint, sulphuric acid 4 fluid oz., bichromate potassium 4 oz.

Substratum.—Whites of 2 eggs well beaten, 6 pints of water, and 1 dr. liq. ammon.

Negative Collodion for Iron Development.—Alcohol 1 pint, pyroxyline of suitable quality 250 grains, shake well and add ether 2 pints, *Iodize this by mixing with* one-third of its volume of alcohol ½ pint, iod. ammon. 80 grains, iod. cadm. 80 grains, brom. ammon. 40 grains.

Normal Iron Developer.—Water 10 oz., proto-sulphate iron ½ oz., glacial acetic acid ½ oz., alcohol ¾ oz. The amount of proto-sulphate iron may be diminished to ¼ oz. when full contrasts are desired, or increased to 1 oz. when contrasts are unduly marked. With new bath quantity of alcohol may be reduced to ¼ oz.; but when bath is old more is wanted.

Intensifying Solution.—Water 6 oz., citric acid 75 grains, pyro. 30 grains. When used, add a few drops of the silver bath to each ounce.

Lead Intensification.—After neg. washing, immerse in dist. water 100 parts, red pruss. potash 6 parts, and nit. lead 4 parts. When it is yellowish white wash and immerse in liquid sulphide ammon. 1 part, water 4 parts.

Fixing Solution.—1. Potass. cyanide 200 grains, water 10 oz. 2. Sat. sol. of sod. hypo.

Varnish.—Shellac 2 oz., sandarac 2 oz., Canada balsam 1 dr., oil of avender 1 oz., alcohol 16 oz.

PRINTING PROCESSES.

Albumen Mixture for Paper.—White of egg 18 oz., 500 grs. ammon. chlor. in 2 oz. of water. Beat to a froth, stand, and filter.

Sensitizing Solution.—Nit. silver 50 grs., water 1 oz., sod. carb. ½ gr.

Acetate Toning Bath.—Chl. gold 1 gr., acet. soda 20 grs., water 8 oz.

Lime do.—Chl. gold 1 gr., whiting 30 grs., boiling water 8 oz., sat. sol. chl. lime 1 drop. Filter cold.

Bicarbonate do.—Chl. gold 1 gr., bicarb. soda 3 grs., water 8 oz.

Fixing Bath.—Sodium hypo. 4 oz., water 1 pint, liq. ammon. 30 drops.

Reducer for Deep Prints.—Cyan. potass. 5 grs., liq. ammon. 5 drops, water 1 pint.

Encaustic Paste.—Best white wax 1 oz., oil of turpentine 5 oz.

Sensitizing Bath for Carbon Tissue.—Bichromate potash 1½ oz., water 30 oz., ammonia 1 dr., methylated spirit 4 oz.

Enamel Collodion.—Tough pyroxyline 120 grs., methylated alcohol 10 oz., ether 10 oz., castor oil 20 drops.

Mountant.—1. Fresh solution of best white gum. 2. Fresh starch.

Collotypic Substratum.—Soluble glass 3 parts, white of egg 7 parts, water 10 parts.

Collotypic Sensitive Coating.—Bichromate potash ½ oz., gelatine 2½ oz., water 22 oz.

Collotypic Etching Fluid.—Glycerine 150 parts, ammonia 50 parts, saltpetre 5 parts, water 25 parts.

Printing on Fabric.—Remove all dressing from fabric by boiling in water containing a little potash, dry, and albumenize with ammonium chloride 2 grammes, water 250 cubic cents., and the white of 2 eggs, all being well beaten together. A 70-grain silver bath is used, and the remaining operations are as for paper.

Cyanotype Printing.—Water 1 oz., red prussiate of potash (ferricyanide) 1 dr., ammonio citrate of iron 1 dr. Prepare and preserve in the dark. Float the paper and dry. Fixation by mere soaking in water.

VARIOUS.

Luckardt's Retouching Varnish.—Alcohol 300 parts, sandarae 50 parts, camphor 5 parts, castor oil 10 parts, Venice turpentine 5 parts.

Matt Varnish.—Sandarae 13 parts, mastic 4 parts, ether 200 parts benzole 80 to 100 parts.

Encaustic Paste.—Best white wax, in shreds, 1 oz., turpentine 5 oz.; dissolve in gentle heat, and apply cold with piece of flannel.

FERROTYPES.

Collodion.—Ammonium iodide 35 grains, cadmium iodide 25 grains, cadmium bromide 20 grains, pyroxyline 70 grains, alcohol 5 oz., ether 5 oz.

Bath.—Silver nitrate 1 oz., water 10 oz., nitric acid 1 drop.

Developer.—Ferrous sulphate 1 oz., glac. acetic acid 1 oz., water 16 oz.

Fixing and Varnish.—Same as wet collodion process.

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CONTENTS.

THE WOODBURYTYPE PROCESS.

(THIRD ARTICLE).

THE exposed tissue having been taken from the printing-frame, the next step is to mount it upon a rigid support, such as glass, in order that it may not altogether collapse during the operation of washing away the soluble gelatine; and india-rubber solution has been found to be the most convenient material for mounting the exposed film.

For preparing the rubber solution, it is convenient to make use of the stiff rubber paste or solution which is ordinarily sold in tins, and to thin this down with benzole until it is of such a consistency as to flow readily. A number of glass plates of suitable size are adjusted to a horizontal position upon levelling stands, and sufficient of the rubber solution is poured upon each to cover the entire surface. If a little flows off it does not matter, as it can be caught in a convenient receptacle, and returned to the stock-bottle. The plates should be allowed to remain in a horizontal position until the rubber is thoroughly set; the time required for this varying considerably according to the purity of the benzole used and the temperature, but two hours may be mentioned as an approximation to an average.

All is now ready for mounting the exposed films upon the rubber-coated plates, and the operation is a very simple one, as all that is required is to lay the film, collodion side downwards, upon the rubber surface, and to establish contact by gentle pressure. The pressure may be conveniently applied by the hand, a sheet of paper intervening; or a roller thickly coated with soft rubber may be made use of. In laying down the exposed tissue it is necessary to avoid, as far as practicable, the enclosing of air between the tissue and the plate, and for this reason it is well to first place one edge in contact with the rubber-coated glass, and then to gradually lower the remainder of the sheet. A very good method of establishing good contact between the surfaces is to pass the plates between the india-rubber rollers of an ordinary wringing machine.

The plates are now placed in warm water in order that the unaltered gelatine may dissolve away, and it is convenient to commence the development with water at 40° C. A zinc trough with vertical grooves answers very well for holding the plates, and the water should be changed from time to time. After the whole of the soluble chromium salts have been washed away, the temperature of the water may be raised occasionally, until a temperature of 65° or 70° C. is reached. It is easy to judge of the progress of the development by inspection or by feeling the degree of the relief by the application of the finger. And it may be mentioned that the development may ordinarily be regarded as finished when the bare collodion is reached in the extreme whites. The time required for development varies extremely, as, in some cases, two or three hours are sufficient, while, in other instances, as many days are required.

The development being finished, a final rinse is given with clean warm water, in order to ensure the removal of all the dissolved gelatine, and the plate is placed in a rack to drain. When all surface water has disappeared, the plate is put into a dish containing methylated spirit, in order that the greater part of the included water may be removed from the relief; a period of a quarter of an hour being ordinarily sufficient. On its removal from the alcohol, the plate should be placed in a moderately warm place, in order that it may finally dry; but care must be taken that it does not dry too rapidly, or it may become fractured from the too rapid contraction of the gelatine.

It occasionally happens that it is desirable to harden the relief by means of alum, especially when there is likely to be occasion to keep it for a long time in a somewhat damp locality, or where a very great number of impressions in lead are likely to be required. The best time for the aluming is immediately after the last washing with hot water, and a cold solution of chrome alum in twenty-five parts of water is used; the plate bearing the relief being allowed to remain in this for about five minutes. The subsequent operations are as described above.

When the relief is quite dry, it is easy to detach it from the glass plates by passing the point of a pen-knife under the edges of the collodion, and carefully lifting one of the corners. Under these circumstances, the relief is stripped off, and it brings the film of india-rubber with it. The relief is next laid, with the collodion surface upwards, upon a level surface, and the india-rubber is removed by rolling it up into balls with the finger. Care must be taken not to tear the relief during this process, and it is desirable to have a few smaller weights at hand in order to keep down any parts of the relief which may tend to curl up.

It is not desirable to make immediate use of the relief, as it continues to contract slowly for some hours after its removal from the glass plate; and until it has attained its normal condition of equilibrium, it is liable to break up under the influence of pressure.

It is often necessary to retouch the relief before moulding from it, by removing the projections which result from scratches or pinholes of the original negative. This is very easily done by scraping with the sharp edge of a fragment of glass; and backgrounds or any deeply-shaded portions may be lowered in a similar manner.

The most convenient method of storing away the reliefs is to make up books out of envelopes, the open sides of the envelopes being directed inwards towards the back of the book; this arrangement affording great facilities for indexing the subjects.

In our next article we shall treat of the making of the reverse or printing-mould in lead.

SWING-BACKS, SWING-FRONTS, AND RISING-FRONTS.

BY W. H. WHEELER.

The subject of swing-backs, swing-fronts, and rising-fronts has again been discussed, but without much result. Indeed, the questiou is rather one for systematic investigation, but would be, I venture to think, found clear enough if accurately stated. As it is evidently interesting as well as practically important, I will venture to ask a little space for an explanation which may, I hope, be acceptable to a good many of your readers.

The object of swing-backs, swing-fronts, rising-fronts, or any combination of them, is generally one and the same: it is to get on the plate an undistorted image of some object, generally architectural, with regard to which the photographer is so situated that, without modifying the usual relative positions of lens and plate, the whole of the subject cannot be adjusted on the plate as desired. The first instinct is to point the lens and camera upwards towards the middle of the object, the image of which is then probably all right on the plate, but with the important drawback that vertical lines are so represented only in the middle, those on each side being observed to converge towards one another in a manner too familiar to all of us to require further description. I am supposing that some form of "rectilinear" doublet is used, in which, as in all decent doublets, the distortion due to the lens is fully corrected. Into the complications arising when it is sought partially to correct the distortion of a single lens by combining any of these methods, I do not propose now to enter. We will consider the case in its simplist and most usual form; and I will further assume—writing to photographers—that no description of these familiar adjustments is required.

It is an interesting and convenient fact that in a strictly symmetrical and non-distorting doublet the positions of the stop and of the optical centre of the combination are identical; and the proposition will therefore be accepted as indisputable that, with such a combination, the relative directions of all pencils passing through the stop are the same as though there were no lens at all, only the stop. Their course will therefore be accurately represented by straight lines drawn from any part of the object, passing through the stop (where they intersect), and finally resting on the plate (or focussing screen) at the corresponding parts of the image. From this the result will be found inevitably to follow that the scale of the object and of its image are the same in all parts only when the planes of both are parallel to one another. Want of parallelism in the vertical plane we call distortion; for the eye is not satisfied unless vertical lines are parallel. Want of parallelism in the horizontal plane we call perspective, and are perfectly satisfied with the natural effect produced. It will be necessary to take the proposition as proved* that the vertical lines of a building will be represented as parallel when—and only when—not only they are formed by a non-distorting combination, but also on a plate or focussing-screen as truly vertical in position as is the building.

Thus when the camera has been tilted (according to our first instinct) towards the centre of the lofty building, and convergence of the vertical lines thereby produced, an adjustment of the swing-back may bring the focussing screen again to a vertical position, and the converging lines are restored to parallelism. But the picture is no longer seen to be *in focus*. If the middle be sharp, the base of the building is too near the lens, and the top too far from it. To correct either one of these faults obviously only makes the other worse. Some one suggests, therefore, "use the rising front instead." We restore the camera to its original position; finding, of course, as at first, that the upper part of our subject is below the bottom of our focussing screen. We raise the front carrying the lens, and with it the image, until (if our lens embraces a sufficiently wide angle) the whole of our subject is seen depicted on the screen. How about the focus now? The top of the building is perhaps not so sharp as we could wish, and we may find, on attempting to sharpen it by shortening the focus, that not only is the definition of other parts injured, but that by no adjustment can we bring it to a definition equalling that part of the image which is opposite the lens; or even than we obtained with the swing back when we sharpened the top at the expense of the bottom. Why is this? It is because the field of view is neither absolutely flat, nor can the definition at its extreme edge be so good as at the centre, even when adjusted to the best focus attainable there. For in raising the front we moved the lens so as to use the extreme edge of its field of view, because there alone we can see the top of our building. Thus, to compare the injurious effect on definition of a rising front with that of a swing-back, we must note that the fault of the former is the bringing into use the worst part of our lens; while the swing-back throws top and bottom out of focus to an extent depending simply on the angle at which it is inclined to its ordinary position (of perpendicularity to the optical axis), and its error is independent of the covering power of the lens. The value of the comparison must depend, therefore, entirely on the lens used. If that be a combination capable of covering a larger plate, it will probably be better to rely on the rising-front; if otherwise, it may not only be an open question which fault is the more serious, but also we may find that on rising the front we merely bring on to the plate the circular edge of the field of view, and find the desired summit of our building to be still hidden. Suppose we now try the swing-front. By using it we point the lens slightly upwards, leaving our camera still horizontal, and our focussing-screen vertical, and the desired picture is presented undistorted, but with nearly the same want of definition at the top and bottom of our picture as when we used the swing-back alone. In fact, it would be precisely the same, only that we are now using a combination of swing-front and rising-front, instead of the swing-back only. The effect, both on definition and distortion, of swing-front and swing-back are absolutely identical, provided the position of the rising-front is the same. Only there is this practical convenience, that fresh adjustments of the swing-front and of the rising-front may be made without tilting, and do not involve a re-adjustment to keep the focussing-screen vertical, a condition which, as I have shown, is essential to an undistorted image of a vertical object. On the other hand, the swing-back is sometimes an easier means of adjusting to this verticality, than to adjust the camera to an accurately horizontal position. In very difficult subjects, however, all three adjustments may be combined with advantage.

There remains one point to be noticed. It has been objected to a swing-back or front, that placing the lens at an angle other than perpendicular to the lens axis must have a distorting effect. We can all see, when adjusting the swing-back after tilting our camera, that vertical lines are *lengthened*. But the truth is, that this is a *correction* of distortion. For a want of parallelism in the vertical planes of object and image affects not only the parallelism, but also the *length* of vertical lines, which are shortened in the proportion of the cosine of the angle contained to radius, and are restored to their proper length when parallelism is restored. For this reason the method commonly recommended for correction of a distorted photograph in copying is a mistake. Instead of placing the print or transparency to be corrected at an inclination from the vertical, and making the new negative on a vertical plate, the copy should be vertical, and the sensitive plate inclined. A short-focus wide-angle lens and a swing-back to incline *from* the vertical, are the fittest for this pur-

* If we draw the straight lines as described, we shall find that with object and image in parallel planes, and only then, the triangles on each side are strictly proportional, having their common intersection at the stop. I believe the correct demonstration will be found in Euclid, vi. prop. 6.

pose. Absolute accuracy can only be insured when the focal distance bears the same proportion to the plate as in the original negative. But by the method ordinarily recommended, the corrected picture is apt to be *stunted*.

THE SPECTROSCOPE AND ITS RELATION TO PHOTOGRAPHY.

BY C. RAY WOODS.

IV.—Colour.

On emerging from the prism, a ray of light is, as we have seen, spread out into a band, which produces a series of sensations on the retina of the eye, known as "colour." The question of colour is of far too much importance to be lightly passed over; it is not to be left out of the photographer's calculations, and is continually coming to the fore in all branches of his practice. That different colours—or, more correctly speaking, objects the light from which give rise to different colour sensations—produce vastly different effects on a sensitive plate, is too well known to need repetition here, and this fact is frequently bewailed. It must not be forgotten, however, that this has its advantages as well as its disadvantages; in illustration of which it is simply necessary to mention the question of dark-room illumination. It would be very awkward indeed if we had to work now as some of the early workers in photography did—in darkness. This is one of the main advantages in the inequality of the reducing action of different parts of the spectrum. One of its main disadvantages is, that the comparative luminosities are not fairly represented in the photograph; but nature herself steps in to our aid here, in never giving us purity of colour.

The question of colour sensation has always presented difficulties—difficulties that were more readily mastered in by-gone days with very imperfect knowledge, than they can be at the present time with less imperfect knowledge. The subject is a fascinating one that has occupied the attention of many masters of science. Books have been written on the subject; and it is obvious, therefore, that only a few of the most important points can be touched upon here.

It had been known as long, probably, as the art of painting had existed, that the artist could produce from three pigments any of the other colours. The three colours which could not be imitated by mixture of other pigments were red, yellow, and blue, and these were called the primary colours. Newton's experiment seemed to add confirmation to this view, for the other tints of the spectrum were easily explained by Sir David Brewster on the supposition that they were produced by the overlapping of its three primary colours. More modern experimenters, notably Helmholtz and Maxwell, by experiments on the mixing of lights of various refrangibility (or, to use more popular terms, mixtures of coloured lights as distinguished from pigments), came to the conclusion, first mooted by Young at the beginning of the present century, that red, green, and blue or blue-violet, came nearer to being the three primary colours than red, yellow, and blue. There are three colours in the spectrum which, it is said, cannot be imitated by mixtures, that is mixtures of coloured lights; and because they cannot be imitated they are sometimes regarded as the primaries; these are the extreme red and violet, and a deep olive green.

Clerk Maxwell, however, considered the primary colours to be:—1. A red resembling the pigment vermilion, situated about one-third the distance between C and D from C; 2. Green resembling emerald green, situated about one-fourth the distance between E and F from E; 3. A violet-blue, situated midway between F and G, and capable of being fairly represented by artificial ultramarine.

It is not easy, however, to satisfy the spectroscopist that the eye is capable of receiving only three independent sensations of colour. From red to violet the spectrum is one beautiful gradation of colours melting imperceptibly into one another; the greater the dispersion the more noticeable does this become. True, the eye is not delicate enough to distinguish between the tints of two lines lying very close together, and yet it has been estimated that about a thousand different tints can be counted. Each of these tints would be regarded as a primary colour, were the wave length producing it the only factor brought in to decide what is a primary colour, and what is not. The difficulty of arriving at a true explanation of the sensation of colour is due to our lack of knowledge of what takes place after the waves of light reach the retina. It is known that there are certain structures there called rods and cones, which have something to do with carrying the sensation of sight to the brain, but that is all. The three-colour sensation theory has to rest on an assumption that each terminal of the optic nerve ends in three organs, which are capable of responding to certain portions of the spectrum, and each wave of light (unless it is capable of causing one of the three primary colour sensations) produces two distinct sensations. Anatomy has no knowledge at present of any such structure, and the theory at present rests on evidence derived from experiments with coloured lights, and on deductions from the study of colour blindness. The subject is in a somewhat unsatisfactory condition, and, as already mentioned, authorities hold different opinions as to what reds, greens, and violets are primary, after all.

But be the explanation of colour sensation what it may, the artist will take the old view of the question. Colour and pigment are to him such interchangeable terms, that to him there always will be three primary colours, but *his* primary colours will be red, yellow, and blue, as of old. The three-primary-colour theory has been to him, and is likely always to be, a valuable working hypothesis, and, providing that *pigments* are understood, there can be little objection to its retention.

The writer must ask the reader's pardon for this little digression. The interest attaching to this still debateable subject is common to all, especially to photographers who are not indifferent to the subject of colour, although their results are produced in black-and-white, and this interest must be my apology. It is only a digression in this sense: that the explanations of colour-phenomena that the photographer meets with are comparatively simple, and do not require the aid of any such theory. The retina of the camera, if such an expression may be used, is well understood. The sensitive plate is a ground capable of being influenced by certain portions of the spectrum. It may be said to possess, in a transcendant degree, that colour sense which to us is weakest, namely, the blue. As will be shown in the next chapter, we may say in a general sense, that it is the *most* refrangible portion of the visible spectrum which produces the *most* effect on a plate. We have, therefore to consider the nature of the light received from terrestrial objects, paying most attention to the blue. A brief consideration of what takes place in reference to coloured glasses and pigments is all that is required to properly understand the matter.

If a piece of yellow glass be placed before the slit of the spectroscope it will be seen to cut off a lot of the violet and some of the blue, letting most of the green, yellow, orange, and red pass through. The yellow colour is given to the glass by the combination of tints that pass through it. If a piece of cobalt blue glass be examined, it will be seen that it derives its colour from the violet and blue rays chiefly, as well as to parts of the green, yellow, and red. Its absorption takes places by two bands in the red, and a smaller general absorption along the red, yellow, and green. If these two glasses be placed in contact, it will be found that they appear green, the spectroscope showing that it is the green and green-yellow rays which find their way through. But if these two glasses be placed in separate optical lanterns, and the lights be projected on the same screen, it

will be found that white light is produced tinged with yellow or blue according to the colour that is strongest. In the first case we have the difference, in the second case the sum, of the rays which they transmit.

A mixture of pigments resembles more the first than the second of these two cases; the light sent to the eye is chiefly that which neither of them absorbs. Hence it has been said that "every mixture on the artist's palette is a step towards blackness." What we meet with in nature is analogous to the effect produced on white light by a pigment, and just as we seldom find pigments that reflect light from a limited portion of the spectrum only, so do we seldom or never meet with pure colours in nature. They may be pure in the artist's sense of the word—that is, they may be clear and bright—but never pure in the sense that the spectroscopist uses the word.

In addition to this lack of purity in colours, all objects reflect more or less white light from their surfaces as well. A striking instance of this, for example, may be observed by looking at grass or foliage in bright sunshine through cobalt blue glass (as pointed out by Mr. Woodbury*), or through permanganate of potash; it is suprising how red they appear, that colour appearing to predominate over the rest. But for this reflected white light it would be almost impossible to get detail of objects otherwise lacking in rays of high refrangibility without very considerable over-exposure in others.

A TRIP TO THE GREAT SAHARA WITH A CAMERA.

BY A COCKNEY.†

This afternoon we had a sensation. Two English ladies who are with us here went to a harem, or in other words paid an "at home" visit to the native schoolmaster of Vieux Biskra. What a chance for Mr. Bolas' detective-camera, I thought, if only in the form of a muff or reticule; our lady friends could then have secured some "interiors" of fabulous value. But all the wishing in the world would not convert my tourist apparatus into the desired form, so Jones and I had perforce to wait patiently for a picture of the harem in words.

"What did you see? what did you see?" was our rather rude enquiry the instant the ladies came back. Well! they would tell us all about it. In the first place they had some coffee—some delicious coffee. "Some what?" I ask, for at times my hearing is a little defective. "Coarfy, if you don't understaud!" roars Jones in a vulgar tone (I am sure I am no worse a Cockney than he is, and I would tell him so, only I don't want to interrupt just now). Well, they had some delicious coffee, and down stairs they saw three plain and untidy women at work weaving. And then——well, then, after they had drunk the coffee, most delicious coffee, they shook hands with the three women, and then——

"Yes, yes, and what else did you see?" we say, eagerly. Well, it seems, they drank the coffee, the delicious coffee, and then they shook hands with the untidy women—very plain and untidy—and then——

Well, then, the story ended very much like one I have heard our excellent comedian, Toole, tell, of his once going to an hotel, and making his way to the wrong room; if I remember right, his number was 6, but that on No. 9 door happened to be loose, and had swung round looking like No. 6. He opened the door, only for a moment, and then he saw——well, well, he couldn't bring himself to say, he was so startled. "But what was it?" the comedian is asked. "What was it? Why, I simply opened the door a few inches—of course I thought it was my own room—and then——but 'pon my word I couldn't tell it." "Not tell it! then write it down," he is implored. "Write it down! never. You know I thought it was my own room at the time, and when I opened the door—well, there—no, I really couldn't do it." And so it was with the harem visit; we only heard of delicious coffee, and of three untidy women.

Biskra is getting a little warm for us now when we make an appearance with the camera. Youthful Arabs start up from every corner at the sight of the apparatus, and mob us right and left. It is not so much a question of sous—although these are in brisk demand—so much as the honour of being photographed, that interests them. They have discussed among themselves the nature of the apparatus, and begin thoroughly to understand its capabilities. I want to get a picture of our auberge—the Grand Hotel de Sahara, as it calls itself—but when I set up the camera and begin to focus, there are nothing but big black heads bobbing all over the ground glass. Jones tries his best to get them back, but no sooner is the front row disposed of, than a second and third show up. They want to be photographed, as their comrades were the other day, and they don't mean to budge till they see the instrument at work.

In these circumstances I have recourse to a little artifice, well known to most photographers. Jones groups the young ragamuffins very seriously, gruffly bids them be quiet, while I let the drop-shutter fall two or three times. In this way we please them all round, and in a few minutes everybody is taken to his satisfaction, and willing to retire. The hotel colonnade, with a graceful palm stem in the background, should make a capital picture, and serve as a pleasant reminiscence of Biskra, so I am anxious to get a successful result. Unfortunately, just at the last moment, the landlady, who is standing at the gateway, in her anxiety to please us, orders off a group of Arabs who are quietly squatting on the curb, and thus robs the scene of much of its character. However, I have it over again, pressing a few young *Indigenes* into the service this time, and hope to get something better.

This is not the first time I have had to do "hocus-pocus" with the camera, as a means of quickly satisfying importunate appeals. I was worried by an Arab guide, who knew everything, to photograph a small cascade near El Kantara. However wonderful it might have been to him, it presented nothing to a European, but as the quickest way out of the dilemma, I turned the camera round and fired point blank at the falling water, without troubling, of course, to put in a dark-slide.

In selecting objects for the camera, I go on an old plan I have adopted on previous tours. It is to prefer character to natural beauties; that is to say, rather than photograph a waterfall, mountain, or lake, I choose objects that unmistakably show the character of the inhabitants. I do not mean to deprecate landscape photography, and should, indeed, only be too happy to be able to retain *souvenirs* both of the geography, as well as of the people of a land I visit; but since, under the circumstances I travel, my plates are few, I must perforce incline to one class of picture or the other. You see, a waterfall, or cascade, however grand it may be, never furnishes such a "speaking likeness" hereafter to the traveller, as does a corner of a street, an old church, or perhaps a market place. The cascade may be in the Tyrol, or Norway, or Switzerland; but if you secure a picture of your hostelry with perhaps a figure or two, or of a bridge, or a turnpike, or a bazaar, or mosque, or anything else that has distinctive character, then I hold you fulfil your purpose as a tourist photographer in the best way you can.

There is another reason, too, why pure landscape is not a good investment to the tourist. He has not experience enough to treat it as it should be treated, and as often as not, his camera dwarfs the grandeur of the scene. I once heard a critic say of a photograph: "Oh yes, I recognise the place well enough; but the photograph hasn't any of that grandeur with which the scene inspires you at first sight; it is the impression that you get after you

* Tyndall on Light.

† Continued from page 165.

have been looking at the place for half an hour." He was quite right; the photograph was a true representation of the scene with five-and-twenty per cent. discount off. The photographer had forgotten to raise his lens, and so the horizon was depressed throughout.

I must not forget to mention the Jardin Landon, which is one of the attractions of Biskra, a tropical garden laid out with exquisite taste, replete with sanded paths, cool brooks, shady bowers, and trimly-kept flower beds. It is the property of a benevolent gentleman—that villa at Philippeville with the lions, I have mentioned, belonging to him—who has made tropical vegetation a study, and who shows the visitor well nigh every variety of shrub that will grow hereabouts. Here is the cocoa-nut palm, the bamboo, the eucaliptus, the sago-palm, the banana, &c., &c., while in conjunction with these there are grassy lawns that would be the envy of a British squire, and aloes and cacti such as the curator of Kew Gardens can only dream about. Moreover, the owner of this green paradise is a thorough-going disciple of the no-fee system; at the entrance gate is a large board bearing in bold characters two notices: one an invitation to the visitor to enter and remain as long as it so pleases him, and the other an urgent request to pay nothing to the Arab attendants.

M. Foureau—whose stand and dark cloth, by the way, I take the precaution to borrow during my photographic excursions here, since they are far superior to what I carry—complains a good deal of the bright yellowness of the light in the desert. He has an idea of trying a disk of blue glass in front of his lens this next summer to modify the glare, a suggestion, it may be remembered, made many years ago by M. Gaudin. The plan, I believe, has never been found of very practical value, for both glare and intensity of light can be modified by other and more simple methods. Another theory M. Foureau has is, that exposed plates should not be left too long before development. He never likes to allow his films to remain more than a month or six weeks between exposure and development, otherwise their treatment in the developing solution gives, as a rule, some trouble.

But our week at Biskra is at an end, and it is time to return on our way to Batna. So tedious is travelling hereabouts, that I may mention it will take longer for our little party to get hence to the town of Algiers, than it took us to travel from London to Constantine. The diligence bears us once more to Batna, and thence we take rail to Sétif, the distance as the crow flies being about eighty miles, yet involving eight hours' confinement in a railway carriage.

The Arab market at Sétif is one of the largest in Algeria, and one little feature of it I must, as a Cockney, here record. As we came to the end of a broad thoroughfare, there sat a small group of Arabs, in noisy excitement, squatting round a bit of carpet. Naturally, we stopped and looked on. It was the pea and thimble trick of Epsom race-course in full swing, the operator, however, manipulating with three walnut-shells and a pebble. He was a very stupid operator, for every now and then he left the pebble quite visible under the shell; still, he was not so stupid as the Arab who was betting, and who, let the pebble be ever so visible, would go on staking his money on the other shells, and losing countless coin. And as we watched and waited—the gambling Arabs, of course, quite oblivious of our presence—a friendly native, who spoke French, kindly volunteered to tell us all about the game, and expressed his perfect willingness to act as interpreter, in case we liked to take a hand in it. Strange to say, the dear simple children of the desert lost all interest in their game as we departed.

I started in my first letter with a few remarks on keeping down the quantity of luggage, if you valued your peace of mind as a traveller. Here, perhaps more than anywhere else, "baggage is the bane" of travelling More than ever am I pleased to think my photographic outfit does not weigh one ounce heavier; more than ever do I regret my camera is four and a-half pounds of dead weight. The tourist camera—light and non-complicated—is still to be created, and the manufacturer who solves the problem happily, will earn the gratitude of thousands. Our little party, thanks to rigid rule, is capable, at a pinch, of conveying its own luggage from steamer to land, or from station to hotel; but as it is, the frightful examples we meet with of luggage-devouring-Arabs, and baggage-tortured travellers, make one shudder for the horrors we have escaped so narrowly.

PHOTOGRAPHY CONSIDERED AS THE WORK OF RADIATION.

BY CAPTAIN ABNEY, R.E., F.R.S.

The third lecture of this series was delivered at the Royal Institution on Saturday last.

Referring to the previous lecture, Captain Abney said there was one experiment which failed on that occasion on account of the wrong coloured medium being used, but he hoped to show it successfully on this occasion. A wet plate was then exposed and put into a cell in the lantern, the development gradually taking place, and the image appearing on the screen. The lecturer said his audience would remember the experiments of the magnets and the filings, and of the growth of the lead tree illustrating the subject of crystallization; some such action took place in the development of photographic images, the particles as they were deposited attaching themselves to those already in the film. In order that they should be deposited in this manner, it was necessary that the development should not take place too rapidly, or the particles were deposited over the entire film, producing what was technically known as "fog." He showed them in test-tubes that when nitrate of silver is added to pyrogallic acid by itself, an immediate precipitation of silver takes place, but if some restrainer was present, such as glycerine or acetic acid, the silver was deposited much more slowly. As the particles of the subsalt produced by the action of the light in a film were reduced by the developer, the molecules of silver in their nascent state combined with molecules of the haloid salt in their vicinity, forming further molecules of the subsalt ready to be acted on by the developer. That this really appeared to be the case he showed by projecting on the screen a slide which was produced by preparing a dry plate in the bath, exposing it to light beneath a negative, and then pouring collodion emulsion over one half of it; the part treated with collodion was of good density, the other part being thin, showing conclusively that the action of the developer had extended to particles of silver bromide which had had no exposure to light whatever. By means of a piece of bromide paper smeared over in parts with sulphite of soda, the lecturer then showed the action of a sensitizer in reducing the exposure by taking up the bromide as soon as it was separated from the silver by radiation.

It was not only radiation, however, but other forms of energy also were able to produce changes in compounds capable of being rendered visible by a suitable developer. Shearing stress, for instance, was capable of separating the atoms of silver and bromine. A piece of gelatino-bromide paper was taken, and written on with a pointed glass rod, the writing appearing to the audience on the application of oxalate developer. The lecturer said that this experiment had been objected to on the ground that the film was probably disrupted by the glass rod. That this would not account for the phenomenon he was able to show by projecting on the screen two slides. The first was produced by writing on a gelatine plate and developing it; the second by writing on a plate, wetting it, and then melting it to restore the smooth surface of the film; in the second case the writing was still legible, but somewhat blurred, as might be expected.

There was another thing connected with the action of radiation to which the lecturer said he would like to draw their attention. Taking two sensitive plates, one of them was exposed beneath a negative to the light from a Bunsen burner for thirty seconds; the other was exposed beneath a rotating disc to the light emitted by an electric spark, which they were aware only lasted for the two-hundred-and-fifty-thousandth part of a second. Both plates were developed, shown round, and subsequently fixed and shown in the lantern. In the one case the exposure was seven million five hundred thousand times as long as in the other, but taking

the relative sizes of the two lights into consideratiou, the exposures were in the ratio of 7,500,000,000 to 1. Now he could hardly ask his audience to believe that the relative intensities of the two lights were in that ratio, and the explanatiou therefore must be that a greater proportionate effect was produced on the sensitive substance by a sharp hard knock, as it were, than by a slow soft one containing the same amount of energy.

He had yet another action of radiation to show them. There were certain subjects, such as bichromate of potash, which were capable of undoing the work of radiation (this was shown on a piece of bromide paper). But radiatiou assisted this reversing action. Taking a plate from the bath, the lecturer exposed it to the light from a piece of magnesium wire, washed it, treated it with bichromate, and exposed it to light behind a negative consisting of a white cross cut out of black paper. On being placed iu the developer in a cell in the lantern, the white cross on the black ground slowly developed till it reached a good density, thus concluding a very successful lecture.

ON THE PERMANENCY OF SILVER PRINTS.

BY R. STANLEY FREEMAN.*

From the discussious now taking place at the various photographic societies, and in the journals devoted to photography, aucnt the fading of silver prints, I infer that the subject has come so promineutly forward agaiu by photographers finding a great dispositiou in modern prints to fade thau was the case formerly. The cause of this rapid fading must be rather far to seek, or some satisfactory elucidation would ere this have been put forward.

Must we, then, be content to receive as an axiom the saying, that "silver prints *will* fade?" Well; yes. They will, and so will engravings and every other production with paper for its base. But the difficulty is the short space of time photographs too often take to reach this stage. Many of us have photographs by us of twenty years' stauding as good as wheu first produced, and examples of which I will show you, while others but a few months old are passing rapidly away. How are we to reconcile this discrepancy? To what influence does the one owe its preservation and the other its decay, yet both equally, carefully, or carelessly kept? I would like I could tell you. I can only offer a few remarks on the subject.

From the discussion and opinions promulgated by the earliest workers in photography one is led to infer that the permanency of silver prints was more favoured by the old sel d'or, or mixed hypo aud gold bath, than by the present alkaline toning method. But is it so? As an old worker, both in the printing and albumenizing, I trust I may veuture to add my mite of iuformation to that already laid before us through the medium of the photographic publications.

I am of opinion that the permaneucy of silver prints is only in favour of the sel d'or method of touing and fixing at one operation when certaiu conditions are observed, and those conditions exercise an influcnce upon the permanency of silver prints by any of the methods of toning. I have known prints to fade quite as rapidly when toned by the sel d'or bath as by any method subsequently introduced. The first of the couditions essential to permanency I consider to be the use of perfectly fresh albumen, with nothing added thereto but the necessary chloride, whether of sodium, ammonium, or barium, or a mixture of these according to the required time of the prints. There is no question that the use of fresh albumen in the preparation of paper entails more labour in beating up, and greater care is necessary in coating the paper; the glass, too, may not be so smooth and high as that produced by stale albumen. These considerations, perhaps, may account for many manufacturers of albumenized paper using albumen in a state of fermentation, or, as we may judge at times by the perfume of the paper, in an advanced stage of decomposition.

Looking at the constituents of albumen, does it not stand to reason that if in the very first stage of our printing operations we use a material in a state of decay, we introduce the elements of that decay into our photographs? I think this point may be satisfactorily proved us:—Take two sheets of paper—one prepared with fresh albumen and the other with albumen that is in a state of decomposition, sufficiently so as to be unpleasant to a person with a delicate sense of smell. Sensitize those sheets on the same silver solution. What is the result? The paper prepared with the fresh albumen will retain its purity for some time. I have known it to keep a week in cold weather, while that prepared with the stale, according to the extent of the decay, turned yellow before it was dry, or very shortly afterwards. Take prints from these papers, toned by any method you please, and I will venture to say that the prints on the latter or decomposed albumen will soon be in the "sear and yellow leaf."

The next consideration is the toning bath. There are two drawbacks to the use of the mixed hypo and gold bath. The first is its apparent extravagance, and the next, the difficulty of knowing when you have left off toning with gold and begun toning with sulphur. Thus, it often happened that, when a larger batch of prints was toned iu the same bath than the capacity of that bath could possibly tone with gold, part of that bateh would be in a condition to fade on the least provocation, and often without it. But you must remember that the votaries of the art in those days had not the means of information at their fingers' ends the present generation has. Photographic chemistry was at a very low ebb, consequently errors were committed that we should not be guilty of now. Yet, with it all, work was produced by a few able hands that would bear favourable comparison with the work of the present day, as my recollection of the first exhibitiou of the Parent Society enables me to say.

To return, however, to my subject. As to the extravagance of the sel d'or bath, that is more apparent than real, as by a very simple method all the gold not taken up by the prints can be recovered. The process is an interesting one, and made pleasurable at the finish by the large percentage of metal recovered. The whole process of recovery has lately been treated in a very exhaustive and able manner by Mr. F. W. Hart, so that I need say nothing on that head.

Of the alkaline methods of toning I certainly give preference to the carbonate of soda bath, as, although not, perhaps, giving the richness of tone the acetate bath does, I am inclined to think, by comparison, that the prints are more permanent. This bath you must make up freshly each day—presuming you tone every day, or, if not, a few hours before use, and that I take to be in its favour, as I consider a bath that has been used over and over again must necessarily carry some impurities with it. As the undeposited gold can be precipitated with sulphate of iron, there is little gain in pushing a bath to the utmost of its powers.

The next consideration is the ready-sensitized paper, and whether its introduction is in any way answerable for the fading of silver prints. I have been led to the conclusion that it is. The accusation is sweeping, I admit; but as it is founded upon practical experience, and not theoretical reasoning—theory and practice not always agreeing, especially in photography—I shall stand by my statement until refuted by the comparative experiments of others. It has been our custom—rather an apathetic one—so long as a paper would "keep well, print quickly, tone easily, and yield prints of good quality," to be content, giving no thought to the morrow of such prints.

The method of toning the mounting medium and the quality of the mounts have been from time to time put forward as the delinquents in bringing about fading, and albumen more than once has been pointed out as the culprit; but a bill of indictment has never, to my knowledge, been preferred against durable sensitized paper. Well, it is done now, and, therefore, the sooner you constitute yourselves a grand jury to inquire into its merits the better, and if you are unable to return a true bill, my experience will not be verified.

We must bear in mind, when making comparisons between the permanency of prints of the present day and those of the past, that in the earlier days of photography absolutely fresh albumen was considered imperative in the preparation of paper—so much so, that each egg was broken singly into a cup in order that its freshness might be assured before being added to the bulk.

What is the moral of the little I have had the privilege of saying? Firstly, that if you wish to secure the greatest amount of permanency in your prints, use paper that has been prepared with absolutely fresh albumen, with nothing added but the salting medium. Secondly, whether you tone by the sel d'or or one of the many alkaline methods, do not overwork your bath. Thirdly, watch the behaviour of your ready-sensitized paper. Lastly—and this is only a hint—finish washing in several changes of warm water.

Bear these items in mind, and I think there will be less cause to complain of the fading of silver prints.

* Read before the Newcastle-on-Tyne and Northern Counties' Photographic Association.

RECREATION IN ART.

BY JOHN SIMPSON.*

To a Society such as this, with its several hundred members, the vast majority of whom are amateurs studying photography for the pleasure it brings, it may not be amiss to turn aside for an evening from the dry bones of technique and manipulation, to consider in what way photography stands related to other arts as a source of recreation and enjoyment.

To the professional, who has to attend upon the wants of a somewhat captious and exacting public, the practice of photography may be some *few* degrees removed from the domain of pure pleasure; indeed, if we are to believe the facetious "notes" and "incidents" recorded in the journals from time to time, it would appear that few occupations are more irksome, worrying, and wearying than the photographic portraitist's. So that even to them the following remarks may not be without their interest. They are, however, more particularly addressed to the younger amateurs of the Society—to those who, while delighting in the skill of a handicraft, exercising both brain and hand to the utmost, yet look upon the pursuit as a pleasant, a rational, and artistic pastime.

It is not necessary at this time of day to urge the necessity of recreation. Every one recognises the need for it; it is one of the prime necessities of civilised life. The more complex society becomes, and anxiety and worry ramify life in its various relations, commercial and otherwise, the greater is the need of sources of relaxation which shall give rest and change to those faculties and powers that have been perhaps overtaxed, or at least kept too long in a state of tension.

My special plea is for the higher forms of recreation, in that sphere where not only can our higher faculties be brought into active exercise, but where the light of genius sheds its rays upon our path, revealing the beauty, the grandeur, and sublimity of nature; that sphere is the sphere of art, and its seers, its prophets, its missionaries, are the true artists, under whatever name they may be known, and with whatsoever implements or tools they may wield their power. There is no recreation so beneficial, so much in unison with our constitution, as that which ministers to the imagination.

Photography, of all the arts, is one of the most *practicable* as a source of recreation in the largest and widest sense. It gives opportunity for the employment of every faculty. Brain and hand, muscle and nerve, must equally come into play. But not only these, which are but the generalities of our possession; there must come into full occupation, taste, judgment, observation, a quick sense of harmony, of space and time, of cause and effect, and, above all, a deep knowledge and love of nature. To him who possesses these qualities, not only will photography be an *available* art, but one in which he will find endless and ever widening recreation.

It may be safely affirmed that there are possibilities of art-culture latent in every one, be his daily calling what it may, and no better instruments exist for calling these possibilities into play than the camera and the sensitive plate.

With these a man may discover a whole continent in himself, of powers and capacities that were known neither to himself nor his friends. Many in this Society, I have no doubt, could verify that assertion in their own experience. By the use of the camera they have come to realise what beauty and grandeur are in nature, and their great ambition as well as delight is to be able to secure transcripts of these as mementoes of things their souls now love. Before they knew it, form had no poetry, no enchantment for them. Outlines and space were but elements of objects that were so common, and of "the nature of things," as to be unworthy of observation. Now, the camera has shown to them that all things, the commonest and the meanest, have a beauty, a charm, a character that is not only worthy of passing observation, but of transcription and preservation. Need I refer in illustration of this to the last popular entertainment of this Society? On that occasion (as well as on many former ones) there were representations of objects, the charms of which lay entirely in the delineation of form. This was particularly the case in groups of cattle and of birds. Few people but would confess to a liking of either horses or swans from their boyhood up, that liking resting, however, chiefly, if not entirely, on the intelligence and gentleness of the creatures, rather than their æsthetic qualities. Those, on the other hand, who "took" those groups I have referred to, took them because they had come to appreciate and love form. I say nothing about the sentiment that may exist in a picture of cattle listlessly standing knee-deep in a stream, or of sheep browsing on a quiet hill-side. Their forms are not the least of the aspects that strike the mental excitation. But when you find an amateur "catching" horses standing heads and tails in a stubble field, with no picturesque accessories to enhance or even to form a picture, be sure he has had his mind bent on securing those graceful lines, those facinating contours that have ever made the horse a favourite with artists and lovers of nature. He has caught the infection of beauty, and is on the way to understand its principles without the tedious drudgery of studying definition, explanations, and all the paraphernalia of science and literature.

Already he has mastered perhaps more than Hogarth could impart to him in his interesting "Essay on Beauty," with his investigations into the secrets of the ancient masters, and his laborious conclusion that it consisted after all in the use of the curved or spiral line—the line of beauty and of grace. But besides *form*, which is the *chief* object of the camera to secure, there is the indication of air, space, and distance, tone, colour, and definition to be obtained, and these must first be seen and appreciated before they will find their proper representation in the finished picture. This also, it is gratifying to say, was well illustrated in the collection shown at last meeting. Some sea pieces, with yachts in full sail and steamers *en route*, showed considerable feeling of tone and air effect, both sky and sea being, in many cases, harmonised remarkably; so soft and at the same time so firm were the relative tone-values that no difficulty was experienced in distinguishing degrees of distance and local effects. Those who set themselves to take "pictures from Nature" by the camera are thus bringing themselves into contact with the very spirit of Nature, from which contact, with its deeper knowledge and keener insight, there arise love and admiration, a desire ever to be with it, to share its bounties, and *this* is of the essence of real æsthetic recreation.

* Abstract of a communication to the Edinburgh Photographic Society.

Notes.

The Year-Book of Photography and Photographic News Almanack for 1884 is out of print.

We make this announcement with no little gratification, since it is the best proof that can be adduced of the appreciation of our little annual. Though the edition this year was considerably greater than on any previous occasion, this is the first time it has run out of print within three months of publication.

A new departure in photo-ceramics is announced. Last Friday, at the Russian Polytechnic Society, Lieutenant Pavloffski demonstrated a new process of producing photographic enamels, which—we have Mr. Warnerke's word for it—will revolutionize altogether our present plan of preparing photographs on porcelain. Not only this, but Lieutenant Pavloffski's process adapts itself to producing photographs on wood and canvas for engravers and painters. Let us hope, therefore, that Mr. Warnerke's opinion of the process, the details of which we shall publish next week, will be fully borne out in practice.

We much regret to announce, by the way, that a sad mishap has befallen Mr. Warnerke. While visiting the theatre at St. Petersburg a few days back, his pocket-book, containing some two thousand roubles, was stolen from him.

Mr. Robinson's new book announced as in the press by Messrs. Piper and Carter, is likely to prove the most popu-

lar work of the season. The chapters on art photography recently appearing in these columns from Mr. Robinson's pen will be incorporated in the volume, which will be profusely illustrated, and form a complete manual of picture-making by photography.

Mr. Moncure D. Conway made a happy use of the word photograph in his lecture last Sunday on the "Poetry and Prose of London." He spoke of the London Press, with its rapidity and minuteness of detail, as photographing the action of the world from day to day. It is impossible now, the lecturer said, to hamper or check "the free speech of this free city. The sun never shines through a day, but it prints here that day's photograph of the world. The eyes of our press go to and fro in the earth, and drag into the light every wrong and crime." A better compliment surely could not be paid, than to compare in this way the detail of the London Press with the detail of a photograph.

Next week Dr. J. M. Eder will contribute an important paper in connection with the past history of photography.

News of the awards made at the Calcutta Exhibition reached us by the last mail, and we are glad to find several well-known names in the list of honour. Thus, Mr. Frederick York secures a first-class certificate and a silver medal for a collection of lantern transparencies; Mr. H. Manfield, of Northampton, receives also a first-class certificate and silver medal for his "interiors," a series that has repeatedly won him honours in this country. Mr. G. Renwick, of Northampton, gets likewise a silver medal and first-class certificate for an exhibit of snow scenes, of which we have several times spoken highly in these columns.

The Autotype Company has not been overlooked at Calcutta, for their name is set down for a silver medal and first-class certificate in recognition of the excellent examples of photo-mechanical printing they forwarded to India; while equal honours fall to Messrs. A. and W. Dawson, whose names are connected with some exceedingly fine typographic etchings and photo-engravings.

Writing on the subject of the photographic section of the Calcutta Exhibition, our friend Major Waterhouse says: "Some of the finest pictures in the Exhibition are by Mr. J. W. Lindt, of Melbourne, who takes a gold medal, while a similar high award falls to the lot of Messrs. Bourne and Sheppard, of Calcutta, who also make a very fine show."

The Exhibition closed on the 8th of this month. The Military Geographical Institute of Vienna, the Military Topographical Institute of Florence, and the Military Photographic Institute of Brussels, all take silver medals for their photo-mechanical work.

Sorry tidings if it come to pass. The jury on the Chadderton accident are of opinion "that no person should be permitted to *give exhibitions of explosive gas* without a licence for such purpose first obtained.

The notice of Dr. Eder's book, "The Chemical Effect of the Spectrum," in last week's *Athenæum*, bears somewhat on the doubts which were expressed on the subject at the last meeting of the Photographic Society. One or two of the speakers, it will be remembered, were more inclined to place faith on actual everyday experience in the dark room as a test for actinic light, than on photographs of the spectrum, alleging that sufficient was not yet known—even by those who had investigated the subject—to make spectrum tests reliable. Still, the reviewer of Dr. Eder's book is rather difficult to please. In the first place, he says that the title is a misnomer, since it treats "in a very general way of the chemical agents which are susceptible of change under the influence of the sun's rays," while it contains "very little information as to the extent to which chemical changes are produced by the several rays of the prismatic spectrum, whether isolated or combined in action." The reviewer also alludes to what he takes to be a contradiction, in the following terms: "The author and his translator refer all the changes with which this volume deals, to the chemical action of the luminous rays," yet in the last chapter, which is devoted to the general effect of the spectrum, we are told that "there is a point in the spectrum where the chemical action of light is *nil*, this point being where the luminous influence is the most powerful." Well, if we had no critics, we should have no controversies.

Mr. Greenwood Pim has recently been advocating before the Royal Society of Edinburgh the use of eosine-treated bromide plates where colours have to be photographed. The plates he found so beneficial are prepared, he tells us, with eosine in the presence of an alkali, usually ammonia, and they appear to owe their property, he says, more to the chemical action than to the physical character of the red colour; for a screen of eosined collodion interposed between a band of coloured ribbons and a sensitive plate had but little effect, except so far as it exerted a general slowing action.

The French Government is about to make a wise move, which our authorities at Greenwich would do well to follow. Some time ago Admiral Mouchez addressed the Minister of Public Instruction on the subject of removing the Astronomical Observatory at Paris to a distance from the metropolis, where the murky atmosphere, no less than the noise and vibration, interfered with scientific work. Admiral Mouchez' suggestion was submitted to various authorities, with the result that his view has now been universally adopted, and the old observatory is to be abandoned. If the light and atmosphere of Paris are bad, how much worse are the thick vapours of the Isle of Dogs that frequently envelop the Royal Observatory at Greenwich!

Some of the continental photographers are very much alive to the value of keeping their names before the public. The other day, in a sleeping-car between Madrid and Paris, we noticed on the walls photographs of several places of resort and hotels of note, one of the best being an interior of the dining-room at a Naples hostelry. The picture was a very good one, showing the decorated

panels and tables neatly laid for dinner, and it served two purposes: first, as an advertisement of the hotel, and secondly as an advertisement to the photographer, Signor Brogi, of Naples. This idea of double advertisements our photographers might occasionally make use of with advantage.

Dr. Eder promises shortly a little work on "Instantaneous Photography," illustrated with forty wood-cuts and one collotype. It is issued under the auspices of the Viennese Society for Diffusion of Natural Science.

A funny thing happened at the last South London meeting. Mr. Robinson sent a copy of his charming composition "Fading Away"—a sick girl reclining on a couch—one of the most touching pictures Mr. Robinson has ever attempted. But some chemists got hold of the print and examined it crucially; they regarded it as an example of imperfect washing, and anxiously searched its surface for first symptoms of "Fading Away."

At a Conversazione of members of the London Tricycle Club, held last week at the Cannon Street Hotel, a tricycle specially arranged for the conveyance of photographic apparatus was exhibited. The arrangement is the invention of a Mr. Pillin.

The portrait club system has been introduced into America. The *Danbury News Letter* announces that a Mr. Hendricks, of Stamford, Connecticut, "is building a photographic studio which will be very convenient, as the skylight is on a level with the street, and especially adapted for the instantaneous cabinet photographs which he proposes making at club rates." These rates are two dollars and a-half for a club of twelve, and paying thirty dollars for twelve tickets, the thirteenth ticket being free.

A society which is doing such good work as the Society for Photographing Relics of Old London ought to be more widely known than it is. Is it not possible to let the public see some of its results? There is a wide-spread interest in old London now so rapidly disappearing, and photographs having an historical or antiquarian association might well be deposited in some place where they could be open to inspection—say the South Kensington Museum or the Guildhall Library. Only a fortnight ago, some one, unaware of the existence of the Society, wrote to the *Athenæum* suggesting that the old houses in Wych Street, now in course of demolition, should be photographed. As it happened, these houses had been photographed by the Society in 1876; but who knew of it besides the members ?

There is plenty of light for taking portraits in Algiers; still the photographers of the fashionable Brighton of Africa ask their customers to come in light-coloured clothing. "Les toilettes claires sont preferables," is the advice given at one of the leading studios.

A correspondent, who confesses that his acquaintance with astronomy is very limited, writes to enquire whether any photographs of Venus were taken "during the recent occultation!" We fear not. A photograph of the "occultation of Venus" would only be paralleled by the definition of darkness which says it is like "a negro in a coal cellar looking for a black cat."

Patent Intelligence.

Applications for Letters Patent.

4759. Theodor Schmidt, 122, Oranien Street, Berlin, Manufacturer, for "Improvements in photograph holders."—Dated 12th March, 1884.

4906. Arthur Fullerton Howman, George Street, Oxford, Oxfordshire, Photographer, for "Dark-slide for photographic cameras."—Dated 14th March, 1884.

4989. James Sturrock, Cashier, Dundee Advertiser Office, Dundee, for "Changing sensitized plates in photographic cameras.' —Dated 17th March, 1884.

Specifications Published during the Week.

3709. Francesco Antonio Marra, of No. 69, New Bond Street, in the County of Middlesex, Artist, "Improvements in the manufacture or production of backgrounds for photographic and other pictures."

My invention has for object the manufacture or production in an economical manner of a brilliant, strong, and durable background that will show up and prevent fading of photographs, and which is applicable also to Indian ink and other drawings or paintings. To produce such a background according to my invention, I employ metal in a pulverized or flocculent state, which I cause to adhere to the paper or material that contains the picture by means of adhesive material such as size. In practice, I find it advantageous to coat or cover the paper or material containing the picture with size of the kind used by gilders, taking care to exactly follow the outlines of the picture; then I sprinkle or flock the metallic powder, or powders, or flakes, on to the layer of size, applying pressure so far as needful to obtain an uniform coating, after which the whole is slowly dried, producing a strong background of paper or other fabric and metal so combined as to resemble a sheet of metal with a sparkling roughened surface, and practically imperishable. Various kinds of metals, such as gold, silver, bronze, aluminium, and others may be employed according to the result desired to be produced, and by the use of two or more different metals polychromatic effects can be obtained.—*Provisional Protection only.*

3,800. Alberta Mary Frances Caspar, of 200 and 223, Regent Street, in the County of Middlesex, Artist, "A new process for preparing and painting photographs, prints, or drawings so as to resemble oil paintings on canvas."

The photograph, print, or drawing selected should be quite dry, and fastened face downwards to a drawing-board or table with four drawing pins. It should then be rubbed with glass or sand paper until it becomes quite thin. The surface of this reverse side must then be spread with an adhesive gum, or paste, or glue, and if a photograph, must be previously soaked with water. The photograph, print, or drawing so prepared is then covered by coarse canvas, and this is pressed and rolled until the fibre of the canvas penetrates and shows through the photograph, print, or drawing. The photograph, print, or drawing and canvas is then allowed to dry, while still fastened flatly to the board or table. When dry, the canvas is stretched on a stretcher. After the canvas is so stretched, the picture is clearly shown thereon, and must be painted with transparent albumen colours mixed with water or a water medium, coarse touches of body colour being freely used to add to the illusion. When the picture so painted is dry, a coat of varnish can be applied to the whole surface of the picture, which will then be ready for framing. The novelty consists in—

1. The preparation of the surface of the photograph, print, or drawing so as to admit of the canvas showing through it.

2. The pressing or rolling of the canvas upon the prepared photograph, print, or picture, so that the canvas shall be seen through the same.

3. The painting in transparent albuminous colours in water which produce upon the canvas so prepared as aforesaid, the resemblance of oil paintings.—*Provisional Protection only.*

Patent Granted in America.

294,485. H. Mandel, Astoria, N.Y., "Process of making copies of tracings." Filed June 26, 1883 (No specimens).
Reproduction by the dusting-on process is claimed.

WAX MATCHES FOR PRINTING TRANSPARENCIES.

BY H. H. CUNNINGHAM, B.A.

In my early attempts at making transparencies by artificial light on gelatino-bromide plates, I found more or less difficulty in determining the amount of exposure necessary; and this difficulty became greater when using different sources of light.

For example, a time exposure to a candle is fairly accurate when the same candle is used throughout, and the same distance from the source of light is observed. But even in the case of candles, there is a considerable variation in the light, according to the condition of the *wick*, both in quantity and quality, considered actinically—*e.g.*, a long wick gives a large flame but a yellow one; and though the total of light is greater, the amount of actinic light is probably much less; at any rate, it is very difficult to estimate.

Again, gas varies very much in the quantity and quality of the light being emitted, according as the quality and pressure of the gas varies; and the light from paraffin lamps is also of a very variable character, and hardly to be trusted for uniformity. It therefore struck me that a fairly uniform, simple, and at the same time easily obtainable source of light, would simplify the production of transparencies, and I found what I sought in the simple wax vesta match. These vary very little in length and thickness among those of the same make, and they can easily be picked out of a size, and, if necessary, cut to an equal length with a pair of scissors; and since the same weight of wax burned in the same-sized wick (temperature and barometrical pressure being unnecessary to consider here) will give as near as possible exactly the same total of light, it will be evident that a very accurate measure of light is obtained by burning a given number of similar wax vestas.

My practical method of proceeding is this. At a distance of 12, 18, and 24 inches from where the printing-frame is placed, I have marks on a board, and I bring the wax vesta in position by sticking it on a pin, raised on a block of wood to bring it central with the printing-frame. Then, all being ready, I strike another match, touch the one on the pin, which of course instantly flames up, and which I allow to burn for half or whole of its length, according to the density of the negative. Of course the first match is blown out as soon as the standard is ignited, and the head of the standard is pulled off as soon as its presence dulls the flame. As an example, an ordinarily dense negative at 18 or 24 inches distance will require about half of one of Bryant and May's wax vestas, burnt in the manner indicated. Dense negatives require two or more such vestas to be burnt, and they may be burnt either together or consecutively, it makes no difference, as we count the total of light as depending not upon the time of exposure, but upon the weight of wax burnt.

HISTORY OF PHOTOGRAPHY IN GLASGOW.

BY ANDREW MACTEAR.

After some preliminary remarks on the general history of photography, the author said: I will now, so far as certain data and my memory serve me, trace out "The History of Photography in Glasgow," and I hope that I may be corrected by any member present wherein I may be wrong.

One of our members, Mr. Samuel B. Brown, being in Paris in 1839, received from M. Daguerre one of his pictures, which on his arrival in Glasgow he exhibited in Royal Exchange Square, and which I recollect seeing. Dr. Paterson (to whom the photographers in Glasgow are largely indebted) as usual with him in anything new and worthy, set to work at it at once. Mr. Brown himself and another member, Mr. Hugh Wilson, were also engaged in it, but who has the precedence I cannot determine; perhaps they will be able to do so.

In June, 1842, I got over one of the American apparatus—I think the very first in Glasgow, and which I have still. The lenses are about four inches diameter. It has a very short focus, and works only a one-sixth plate, and can be worked in a room at a common window. It was so powerful that I worked with it by the north light, and I exhibited two portraits in the exhibition of paintings as having been done by a northern exposure.

In 1841 the first professional photographer who came to Glasgow was Mr. Edwards, who opened in Buchanan Street (opposite the Arcade), and who in dull weather used to secure the loan of my camera. The glass of his place was entirely blue, as was then the custom. In the same year Mr. Treffray also began at the corner of Union and Argyle Streets. Then came Mr. Pickering, and in 1846 Mr. Bernard commenced; then the art made a rapid advance—in fact, his pictures were splendid. Messrs. Borthwick and Stanley next came, and in 1849 Mr. Hughes succeeded Mr. Bernard. Then Mr. Gardner, Mr. Young (1850), and Mr. White successively came forward, the Daguerreotype process alone being worked by all the above.

In June, 1851, Archer's collodion process was published in the *Art Union Journal*, and within five months afterwards Dr. Paterson not only made the collodion, but produced excellent pictures by that process. He communicated the new mode to his friend Mr. King, Mr. Duncan Brown, myself, and many others, and he may fairly be said to be the father of the collodion process here, as he most willingly communicated any knowledge he acquired to all inquirers.

Professor Taylor has also been the means (through his interesting lectures) of producing many excellent photographers, both amateur and professional. I have met with many of them, and they speak highly of the Professor's ability and knowledge of the art.

Our President, Mr. Kibble, must now rank and be awarded the first place amongst our amateurs (which are legion since the collodion process), not only for his great attempts, but for their quality, and his indefatigable exertions in perfecting an instantaneous process in which he has been so successful, and specimens of which I am sure all of you have seen.

I hope I will be excused when I make no attempt at enumerating the names and abilities of such a multitude of amateurs and others who are working the art in all its various styles, as it would be both invidious and injudicious at this meeting.

Within two years (from the simplicity and cheapness of this new process) we had establishments for it alone opened by Messrs. Dessurne (March, 1852), Urie, Taylor, and McNab (May, 1852). When the Daguerreotypists had to follow in the wake, and now the collodion process has become general. I do not know if a Daguerreotype could or would be taken in Glasgow. I think we cannot omit mentioning one name which for coloured positives stands almost unrivalled—I mean that of Mr. Douglas, one of your Council.

The month of June, 1856, ushered in a new feature in the art here, when Mr. McNab exhibited his coloured specimens at the foot of Buchanan Street and elsewhere. I have seen crowds looking on admiringly at these pictures, and I am glad that Mr. McNab has not only reaped golden opinions, but golden rewards for his bold attempt.

Mr. Werge, Mr. Urie, and Mr. Stuart (who commenced in 1855), Mr. Peebles (an excellent calotypist), Mr. W. Young, Mr. Bowman, and Mr. Cramb have all followed in this new channel, and Glasgow can now feel proud of her high position in the photographic world.

I have, therefore, given you the brief outline, which to have been filled up with all the details that might have been given would have occupied too much of your valuable time, and I would take it kind that any errors which may have crept in may be corrected by those who can do so.

[Abstract of paper written in 1864, and re-read before the Glasgow Photographic Association on March 6, 1884].

ON BICHROMATED GELATINE FILMS AND THE STANNOTYPE PROCESS.

BY W. LANG, JUN.*

The action of light on the bichromates in presence of organic matter has been known for a very considerable period. Mungo

* Read before the Glasgow and West of Scotland Amateur Photographic Association.

Ponton, in 1839, was the first to base a process on this reaction. He applied a solution of potassium bichromate to paper, dried it in the dark, and on exposing to light he found that it darkened very considerably. The chromic acid in the salt was reduced to chromic oxide. Placing paper prepared in this manner behind a copper plate engraving and exposing to light, a negative copy of the engraving was obtained. To fix such a picture, all that was necessary was to wash in water, so as to dissolve away the unaltered bichromate. Here is a print obtained in a similar manner from a copper plate engraving, and which you see is a negative reproduction which is capable of producing in its turn a picture having the lights and shades as in the original. Becquerel (1840) demonstrated that the reduction of the bichromate was due to the presence of the size in the paper, and he devised a process which consisted in mixing the bichromate with starch-paste and applying it to paper. On exposing to light under a copper-plate engraving, and afterwards immersing in an alcoholic solution of iodine, a blue reproduction of the engraving was obtained; the rationale of this change being due to the fact that in those parts where the light had not penetrated (the dark parts of the engraving) the starch remained unaltered, and was able to form the blue iodide of starch. This iodide of starch is, however, a very unstable substance, and although the picture appears strong enough when wet, it loses a good deal of its character in drying, changing from blue to a pale violet. Here is one of Becquerel's pictures.

Hunt worked also with the bichromates, and to the various processes he brought forward, he gave the generic name of chromotype. They consist essentially in forming a chromate of copper in the paper, and after exposure behind the engraving, developing the picture by means of gold, silver, or mercury salts. Some of these early light pictures I have here reproduced.

While it was sufficiently apparent that light had wrought a change in the bichromate employed in these examples, it was further discovered that the organic matter was itself altered in its physical character; in fact, Becquerel's method of producing a picture with the lights and shades the same as the original shows clearly that the starch had been on where the light had access in such a way as to lose its characteristic property of forming a blue compound with iodine. Mixed with a bichromate and exposed to light, gelatine, gum, starch, albumen, &c., were all found to be rendered insoluble. Now what is the cause of this insolubility?

Two theories have been put forward to account for it.

First.—That the organic matter is oxidised at the expense of the chromate, which is reduced to chromic oxide, and the insoluble body is virtually oxidized organic matter.

Second.—That the organic matter forms a true compound with the chromic oxide reduced by light. This view was first propounded by Mr. Swan, of Newcastle, in a paper read before the Photographic Society of Great Britain on May 10, 1870, and it is the one which has the most evidence in its favour. There is, however, much complexity involved in the chemistry of the matter. Mr. Spiller has been making some experiments with the various chromates and bichromates with a view to unravel some of these reactions, and those interested will find a short article by the gentleman in question in the Photographic News Almanac of the current year, giving some details of what he has done and intends doing. In addition to the prints already shown, where bichromate of potash has been employed as the sensitizing agent, I have one or two here prepared with ammonium bichromate and the normal chromate of ammonium. In the case of normal chromate or yellow chromate of potash, light has no great reducing action. In the case of the normal chromate ammonium it is a very sensitive body indeed.

A very curious fact in connection with these changes was demonstrated by Captain Abney. Taking a piece of paper coated with gelatine rendered insoluble by alum, and duly sensitized with a bichromate, and exposing under a negative, he placed it in contact with a piece of carbon also impregnated with a bichromate, and the two surfaces were kept in the dark and under pressure for some ten or twelve hours. The paper that had received the impress of light communicates the action that the light had started to the pigmented tissue, the result being that a picture is obtainable on the film which has never been exposed to light.

The great experimenter in this field of work was undoubtedly the French chemist Poitevin; it is to his researches more than to any other that the whole superstructure of carbon printing, autotype printing, the powder processes, the various collotype or printing with lithographic ink processes, has been raised. As far back as 1848 we find Poitevin devoting himself to the production of photographic relief pictures. He named his process helioplastic, and his *modus operandi* was as follows:—A bichromated gelatine film was exposed to light under a positive or negative according to the nature of the relief picture wanted. It was developed by being allowed to swell in cold water, whereby those parts acted on by light refused to swell, while those that had been protected swelled. This relief picture was hardened in a solution of sulphate of iron, and, after draining, a plaster cast was taken of it. From this again, by means of a fusible composition, another casting was taken, to utilize which, he coated with copper by means of a galvanic current.

Poitevin, however, does not seem to have carried his researches sufficiently far to have made his process a truly practical one. In reading the record of these early experiments, Poitevin seems always to have worked with gelatine in the moist state. It is to Woodbury that we are indebted for a rational process of relief printing, and the reaction by which he obtains his reliefs is the solubility in warm water of those parts of a bichromated film which have been protected from the light. Woodbury's patent for the production of those pictures, known under the name of autotype or Woodburytype, was taken out in 1866. We are all more or less familiar with these productions, and their beauty, apart from the fact of their absolute permanence, attests the value of this very perfect photo-mechanical process.

It may be interesting to note that all those pictures of actors and actresses which appear in the magazine *The Theatre* are done by Woodburytype. In France, the process does not bear the name of its inventor, but is known under the name of photoglyptic. The Woodbury process, while giving such excellent results, is by no means one that amateurs could avail themselves of, as it necessitates the employment of a hydraulic press, whereby the hard gelatine relief is pressed into a bed of lead or other soft metal, which forms the printing mould. However, Woodbury within these last two years has brought forward a process which meets, I think, the requirements of amateurs. To this he has given the name of stannotype, inasmuch as the relief picture is covered with tin foil. Tin-type might have expressed the same idea more graphically, but I think you will admit it lacks dignity. In Woodbury type the start is made with a negative, in stannotype with a positive or transparency. And Woodbury recommends that this be produced by means of the carbon process. The negative from which this is produced will require to be masked, so as to give clear glass all round the finished transparency; the reason of this will be obvious as we go on. The timing of the exposure of the tissue under the negative must be regulated by a photometer, and Woodbury's form of this instrument you have here. After the exposure has been completed, development of the tissue is to be made on a collodionised glass plate well washed to free it from the ether and alcohol. The tissue, having been allowed to soften in water for a short period, is squeegeed on to the glass plate, and, after remaining some little time in contact, the plate with the tissue is plunged into water about 95° F., when the development of the picture takes place so soon as the original paper of the tissue comes away. You thus have a positive picture reversed as regards right and left, and outside of the picture you have clear glass. The reversal of the picture at this stage is necessary, otherwise your mould would throw off reversed prints. Then carbon transparencies require, as a rule, strengthening, and for this purpose a solution of permanganate of potash is made use of—a quarter of an ounce permanganate to one pint water. This gives a non-actinic colour to the picture, the character of which you can judge of from the example I now put forward. You will see that this picture has been masked in such a way as to leave a margin of about one-eighth of an inch clear glass all round the picture. For my own convenience I have made the transparency on a whole plate, but of course the half plate would have been the correct size to have produced the transparency on.

(To be continued.)

Correspondence.

HALATION.

Dear Sir,—You will perhaps think me rather presumptuous, but on reading the able article of Dr. Tulloch in this week's News on Halation—I myself having tried a

number of different things to prevent it—have found the very best thing is a vegetable black, a piece of which I enclose. Scraped with a pen-knife it is used with a little table beer, applied to the back of the plate with a flat camel's hair brush. I send you also by this post a photograph of an interior, the windows opposite the lens being blue and white glass, in which there is scarcely any perceptible halation. I might mention that the black comes off immediately on being wetted.—I am dear sir, yours obediently, F. W. Broadhead.

[The photograph which Mr. Broadhead sends quite bears out his statement.—Ed. P.N.]

THE ETHER LIME-LIGHT.

Sir,—Will you allow me to correct two *errata* in the article on the above? In the sixth and ninth paragraphs, for liquid ether being (in three places) spoken of as driven "with" the oxygen supply-tube or oxygen-bag, it should read "into," as, no doubt, most have discovered. And in the last paragraph but two, referring to safety chambers, instead of "heat" being required, it should read: "They, however, reduce the pressure and the light considerably, and two cwt. will be needed to get the same result as with one cwt. without them." Lewis Wright.

A CAUTION.

Sir,—I write as soon as I can to ask you to insert a caution in your next issue. A stout elderly man, with a plausible manner, is going about amongst photographers with apparent introductions from other photographers who do not do the special kind of work he comes about. He represents that some important work is immediately wanted by some well-known firm, makes an appointment for the photographer to wait on said firm, subject to their reply to the memorandum he asks for, and of course obtains, to use against some other probable victim. When he goes he suggests drinking your health over the important introduction. He looks so respectable and genuine that I dare say he sometimes succeeds better than he did with me—I gave him a few pence. When he had gone I telegraphed to the firm he professed to come from for fuller instructions, and got a letter to-day saying they had half-a-dozen letters and telegrams about the same thing. They do not want any photographing done, and would like to bring the man to justice, and say that he has been going by the name of "Herbert."—Yours truly, H. D.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 13th inst., Mr. A. Cowan in the chair.

The usual routine business having been disposed of, the Chairman invited Mr. T. Bolas, F.C.S., to deliver his promised lecturette on "Photo-Block Printing."

Mr. Bolas commenced by saying that it is a matter of the greatest interest to every photographer that his prints should be permanent. The future of photography will not be very promising if the silver print holds its own against permanent printing. He remembered asking Mr. Edwards some eight or nine years ago what he considered was likely to be the printing process of the future. Mr. Edwards at once replied, block printing. The results recently obtained indicated that he was right.

Electrotype and other block processes are between twenty and thirty years old; but it is only recently there has been a revival of these block processes. To give a list of all the photo-block processes actually at work, and treat each separately, would occupy a dozen lecturettes, therefore only the most practical will be dealt with, touching on points here and there.

Nearly thirty years ago Paul Pretsch came from Vienna, and, with the perseverance worthy of a great man, attempted to introduce his method of printing in half tone by means of the reticulation bichromated gelatine undergoes when soaked in water, after being acted upon by light, this serving as the basis for producing an electrotype.

If bichromated gelatine is poured over a plate, dried, and exposed to light under the negative, then soaked in water, it will be noticed that the smoothness is on the portions which have been most exposed; these constitute the blacks.

The Pretsch process was not worked much commercially. A block illustrating the method will be passed round—this block having been used in printing an illustration of the process in the Photographic News, and in the current Year-Book, page 80.

The company formed to work the process came to grief, but Mr. Dallas, who was with them, makes blocks of a similar character. A Dallas block and print will now be passed round. Mr. Debenham, who made the negative, sent it to Mr. Dallas, and here is a print. The lights and shades are worthy of notice. The Pretsch block, and probably the Dallas blocks, are moulded, as already stated, from the reticulated gelatine original.

Perhaps it is scarcely worth while to lecture on lithography or zincography. Suffice it to say that a fatty image is taken which adheres to the stone, the stone being next moistened with gum-water. An inky roller is then passed over; the damp parts refuse to take the ink. The image on zinc or stone may be converted into a typographic block by treatment with dilute nitric acid, which dissolves away the bare stone or metal to a certain depth. Some care is necessary to prevent the acid working underneath or under a cutting, and thus destroying the fine lines; by dusting with fine resin-powder and warming the plate, this is in a measure prevented. Much work of this kind is carried on daily in many houses in London.

Examples of zinc blocks and fatty images on stone having been passed round, the lecturer went on to say, that the production of a transfer in fatty ink is equivalent to a block. A great many processes might be mentioned, but enough would be said to indicate the method of obtaining an inky transfer.

Translating a Woodbury relief into line or stipple was next dealt with, in their application to photographic images, showing the relation of tone. A gelatine relief on glass having been passed round, the lecturer said it would be understood from that what the nature of a relief is. The thin portions represent the lights, and the thick portions the dark.

Mr. Ives, of Philadelphia, inks a Woodbury relief with ordinary printer's ink. An ordinary printing roller inked, and sufficiently soft to penetrate the depth of the relief, is passed over. If a sheet of ordinary white paper is laid on and pressure applied, we should get an intense black and white image; if grained paper be used, we shall obtain an image with half tones. If we were to examine this grained paper under a microscope, we should see a number of pyramids. A relief was inked and placed in a small press with thicknesses of grained paper to illustrate Ives' method of converting Woodbury reliefs into half-tone.

An Ives' block and print from the same were passed round, the print being made in an ordinary machine, throwing off twelve hundred impressions per hour, and in which no particular care was taken. Comparing the rapidity of silver printing, it sometimes in dull weather requires two days to get a single print against twelve hundred per hour; and taking into consideration that silver prints fade, and block prints do not, a good deal of advantage rests on the block method.

Other methods have been devised, and exceedingly fine work has been done. Here is an example of the Meisenbach process, in which there is a good deal of quality. Block-printing by photographic means is in its infancy. When the manipulations have been studied out as much as silver printing, we may obtain results quite equal. At all events, in the example now shown there is a very good attempt of quality. Three methods of converting Woodbury reliefs into stipple have recently been patented by Zuccato. The first consists in planing metal into a series of pyramids or ridges; this is inked, a sheet of paper is laid on it, over this the relief, when a transfer is obtained by means of pressure. In the second case, fine gauze is introduced; while in the third case the relief is pressed against a stippled or grained impression on a zinc plate or lithographic stone. This causes a spreading out of the lines, which, uniting, forms the blacks of the picture. Mr. Bolas concluded by referring to Mr. Woodbury's method of backing up the negative with fine or coarse net, and from this making a grained relief, promising on some future occasion, when the competition is keener against silver printing, to renew the subject.

The Chairman, in moving a vote of thanks to Mr. Bolas, said they had all listened to his lecture with the greatest interest. He, the Chairman, well remembered assisting Paul Pretsch to make electro-type blocks twenty-nine years ago.

A hearty vote of thanks having been accorded, the Chairman invited a discussion or questions to the lecturer.

Mr. W. M. Ayres, having spoken very highly of the work produced by Paul Pretsch, and his acquaintance with that gentleman, contended that silver prints properly produced are permanent.

Mr. J. Barker wished to know how a gelatine relief is made? which roller is the most suitable to employ? and may common sixpenny ink be used?

Mr. Bolas replied that a strong gelatine solution is made (such as Nelson's No. 2 being used) in which sugar and bi-chromate of potash is dissolved, paper is coated with the melted mixture to the depth of 2 m.m., dried, exposed under a suitable negative, rendering the gelatine insoluble in the exposed parts. The paper is then soaked in water, and mounted on a glass plate; as the gelatine softens, the paper can be stripped off. With regard to the other questions. The ordinary lithographic roller made of sheepskin is suitable; the composition roller, made of glue and treacle, is not suited for stone work, on account of the moisture present; it may be used for anything not in itself damp. Very good prints can be obtained with sixpenny ink if it is a good sample; but as so little is required, a more expensive ink is preferable, as it will go farther, and is of better colour.

Mr. A. L. Henderson enquired if the amount of relief was in any way due to the thickness of the gelatine coating?

Mr. Bolas.—No. Provided the coating is thick enough, the depth of relief is determined by the action of light.

Mr. Henderson desired to know what effect would be gained by the addition of a hard cutting substance to the ink.

Mr. Bolas instanced the photo-gravure process designed by Mr. Woodbury, examples of these being shown at the recent lectures before the Society of Arts.

Mr. A. J. Brown suggested crushed hard bottle glass as being suitable.

Mr. Barker suggested glass-paper, which could be easily procured of suitable grain.

Mr. Bolas said crushed glass suitably prepared is an article of commerce.

Mr. Henderson did not think Sprague's ink-photo process answered the requirements of photographers.

Mr. J. H. Hare.—Is Sprague's process worked like any shown this evening?

Mr. Bolas said the general impression is, a fatty image is put on a litho stone, the stipple being either a Pretsch grain or mechanical. Very good results are obtained by the process, and in judging the capabilities of a process, only the best, not the worst examples, should be taken. Probably Mr. Henderson would agree with him, that there are good and bad collodion negatives as well as many bad silver prints.

Mr. J. Traill Taylor.—Is Mr. Bolas acquainted with a process suggested some years ago by Winstanley, and which he (Mr. Taylor) thought was the first application of the Woodbury process to block-printing? Mr. Taylor then went on to describe the manner of arranging a quantity of suitably-shaped needles so as to permit their falling by gravity on the film; in this state the needles are clamped, raised, and the series of points have a flat stone passed over them. This leaves them either sharp or blunt, depending on the irregularity of the gelatine surface, the impression being a counterpart of the negative, the small dot forming the lights, and the larger dot the blacks.

Mr. Bolas said a client consulted him a few years ago on the subject, and he went into the matter. There were mechanical difficulties not easy to overcome, which, added to the cost of getting square needles manufactured perfectly true, led him to consider the method impracticable.

Mr. Henderson said Mr. Bullock (Leamington) introduced a process some years ago similar to Messrs. Sprague's.

Mr. Bolas replied that in 1866 the Photographic News gave illustrations of the process.

The Chairman having thanked the lecturer for replying to the questions, announced the presentation of two books for the Society's library, for which votes of thanks were accorded.

Photographers' Benevolent Association.

A special Board meeting was held on the 5th inst., at 181, Aldersgate Street.

The minutes of the previous meeting having been read and confirmed,

Messrs. Muller and Collius were elected members of the Association.

The list of members requiring situations and correspondence was then submitted.

The following alteration of Rule 4, clause 1, was then proposed by Mr. Ashman, and seconded by Mr. Ganly—"That subscriptions shall be 10s. per annum, payable quarterly, half-yearly, or yearly, which shall entitle the subscriber to one vote at general and special general meetings; also at each election of pensioners. Rule 4, line 9, word benefit, be struck out."

Mr. Ashman, speaking in support of his proposition, said the existing rule did not allow an honorary subscriber to receive assistance should misfortune overtake him. That he considered a mistake, and to his knowledge deterred some of the profession from supporting the Association. He had no fear that by removing the distinction between the classes, that those gentlemen who had hitherto ranked as honorary members would withdraw their support; the proposition gave them the option of being donors, or donors and members. He would like to see them enrolled as members, and the balance of their usual subscription considered as a donation. At the same time, it would enable those whose position was not fully assured, to feel that in case of need they would be entitled to the support which the Society could render. Again, the reduction of the subscription would enable the assistants who could not afford to subscribe the yearly subscription in once, to do so by two payments of 5s., or four of 2s. 6d., as circumstances would permit. This he believed would considerably augment the strength of the Society, and that most desirable object having been attained, the success of the Society was certain.

Messrs. Ganly, Hall, Thorne, and others spoke in favour of the proposition, which was put to the meeting, and carried unanimously.

Mr. Collins, the son of the late Mr. C. G. Collins, was elected as a member of the Board of Management, and the meeting concluded.

Newcastle-on-Tyne and Northern Counties' Photographic Association.

The ordinary meeting of this Association was held in the College of Physical Science, on Tuesday, the 11th inst., Mr. J. B. Payne in the chair.

The minutes of the last meeting having been read and passed Mr. Andrew Ross, Mr. John Russell, Mr. J. H. Inness, and Mr. F. W. Morgan were nominated for membership.

Mr. R. S. Freeman read a paper "On the Permanency of Silver Prints" (see page 182).

The Chairman remarked that the subject was of a very interesting character, and that no one was better qualified to speak and write on such a subject than Mr. Freeman. Personally, his own experience of silver printing had been considerable, and he detailed an experiment he had conducted some time ago. A sheet of paper was sensitized, divided in two, and these halves were printed together to the same depth as nearly as possible under a mask, and vignetted. One-half was toned, and the other not toned. They were fixed together, washed together, mounted together on the same mount, and exposed together to sunlight. The *toned* print began to fade in the vignetted portion, and in three months had faded altogether. He (the Chairman) remarked that this had never been satisfactorily explained.

Mr. J. P. Gibson was opposed to the use of the sel d'or bath, and did not agree with Mr. Freeman's remarks on the use of ready-sensitized papers, especially those prepared with albumen in a state of decomposition. He (Mr. Gibson) had used ready-sensitized paper for many years, had always found it equal in quality to the paper he had sensitized himself, and far less trouble. He used a toning bath composed of chloride of gold and washing soda, being careful not to use too much of the latter, and he always took care to have his fixing-bath alkaline. Carbonate of ammonia, in the proportion of about two ounces to the gallon of hypo. solution, was used. He thought that damp was chiefly to blame in cases of fading, and some mountants were totally unsuitable. He preferred himself, for mounting purposes, a solution of gelatine with a large proportion of alcohol added.

Mr. E. Sawyer advocated the use of warm water for washing prints.

The Chairman reminded members that the late Professor

Marreco, in a paper read at one of the early meetings of the Association, proved, from experiments, that the copious washing of silver prints so much recommended in photographic text-books was quite unnecessary, and that with care the hypo could be easily. perfectly, and quickly eliminated.

Mr. P. M. Laws deprecated the practice some photographers had of overworking their baths. He always made fresh baths, using as much gold as was necessary, and then discarding the bath. He considered that gold was one of the cheapest chemicals they used.

Mr. Proctor said he had no prints by him. He had, in conjunction with Mr. Swan and Mr. Pattinson, produced many years ago the first prints ever done in Newcastle. They were on plain paper, salted, and sensitized; but they faded very quickly. That was before the introduction of albumen. He (Mr. Proctor) thought very little was known then of the cause of fading, and that they knew very little even now of the matter. The metals forming the tones of the print would be probably in the form of sulphide, and this might eventually turn to sulphate; but, whatever they were, damp and sunlight would favour such chemical changes.

Mr. Freeman narrated his first experience with ready-sensitized paper, and the failure (by fading) which resulted. He would not condemn *all* ready-sensitised papers, as he had found some to be excellent in all respects. He (Mr. Freeman) showed, at the close of his paper, a large number of prints of various ages. Some mounted cartes of the Exhibition of 1862 were excellent. They were toned in the sel d'or bath, and mounted, he stated, with a freshly-prepared solution of gum-arabic.

On the proposition of the Chairman, a hearty vote of thanks was accorded Mr. Freeman.

Glasgow and West of Scotland Amateur Photographic Association.

The usual monthly meeting was held in the Religious Institution Rooms, Glasgow, on Tuesday, the 11th of March, Mr. Hugh Reid, President, in the chair.

Messrs. F. C. Buchanan, James Harvey, A. W. Hogg, and John Sheriff, were elected members.

On the recommendation of the Committee, it was agreed to take a lease of premises for the sole use of the Association, the rooms to be used for meetings, demonstrations, &c.; members also having a right to use them for any of their operations connected with photography.

Mr. Lang, Junr., then read his lecture "On Bichromated Gelatine Films and the Stannotype Process" (see page 186), and gave a demoustration of the whole process of Staunotype printing, and threw off a number of prints at the meeting from moulds made by himself. The interest of Mr. Lang's lecture was much enhanced by a number of very fine specimens of the various biehromated processes, and some exquisite Stannotype prints, all very kindly lent by Mr. Woodbury for the occasion.

The meeting awarded a very hearty vote of thanks to Mr. Woodbury for his kindness in sending the specimens; and the same compliment was paid Mr. Lang for his interesting paper, and for the immense amount of trouble he had taken in getting up his demonstration.

The President then read a letter of resignation from Mr. Smithells, the Secretary, who is leaving Glasgow, and the meeting passed an unanimous vote of thanks to Mr. Smithells for all his work on behalf of the Society.

Mr. George Murray, 31, St. Vincent Place, Glasgow, was appointed new secretary.

Glasgow Photographic Association.

The tenth general meeting of the session was held in the Religious Institution Rooms, on Thursday, the 6th iust., Councillor Robertson in the chair.

The minute of the last meeting was read, and after an addition—viz., the exhibition of a patented camera by Mr. S. D. McKellen, of Manchester, and the thanks of the Society to Mr. McKellen—approved of.

The question-box was then opened, and one of the questions found in it raised a slight discussion which was not satisfactorily settled, viz., "Does the luminous paint used with Warnerke's Sensitometer lose its power through time?"

Mr. Parker then read a paper on a sky-shade invented by Mr Henderson, of Moutreal. As a special article will be published soon on this shade, it is not necessary to comment upon it now.

Mr. McGhie then exhibited several new pieces of apparatus. Addenbrook's instantaneous shutter, giving an exposure as desired from $\frac{1}{4}$th of a second to 3 seconds, and Cadett's latest studio shutter, the principle of which is a sliding front raised and lowered by the usual air-pressure arrangement, both worked very well, and were much appreciated by the meeting. He also exhibited Samuel's uew patent camera, the novelty of which is the dark-slide, which may be made to hold any number of plates. It is simply a box twice the size of the plates to be used, with a division in the centre and a shutter in front of one of the divisions. The sensitive plates, in blackened tin holders, are put into the division behiud the shutter. When it is withdrawn, a strong spring pushes the plates forward, the front plate taking the place of the shutter. It is now in position for exposure. When the shutter is pushed back again, it pushes the plate before it into the other division of the dark-slide, which projects beyond the side of the camera. This operation is repeated until all the plates are exposed.

Mr. Dodd then exhibited a combined apparatus for varnishing negatives and distilling water which he has used constantly with great satisfaction for the last twelve years. It is a flat copper case about thirty inches square and two iuches thick, tinned iu the inside, and standing at an angle of about 80°. There are hooks at intervals on each side to which are fastened movable wooden supports for different sizes of negatives. It is heated by steam conveyed by a tube from a small tinned copper boiler heated by gas. A tube in one of the corners draws off the condensed steam, which, if the apparatus be kept free from dust, is chemically pure distilled water.

The Chairman then called upon Mr. Andrew Mactear to reread a paper which he prepared for the Association twenty years ago, on "The History of Photography in Glasgow" (see page 186).

The meeting closed with the customary votes of thanks.

Edinburgh Photographic Society.

The fifth meeting of the current session was held in 5, St. Andrew Square, on the evening of Wednesday, 5th March, Mr. W. Nielson presiding.

After business of a private character, which occupied more than an hour,

Mr. J. H. Simpson read a paper entitled "Recreation in Art," in which, after referring to the great branches of art, and suggestions for recreation iu them, he referred more particularly to photography (see page 183).

The set of transparencies in gelatino-chloride by Mr. Cowan were then exhibited.

The Secretary intimated that Mr. A. L. Henderson, on his recent visit to Edinburgh, had promised that he would endeavour to get members an opportunity of examining these beautiful productions, and Mr. Cowan had most courteously sent them. The transparencies were examined with great interest.

Mr. A. Pringle stated that he had had an extended experience with the gelatino-chloride plates, having experimented with them from their first introduction. Their manipulation was so easy, and the results so certain, that he fancied if he had had failures he could perhaps have given better information as to the working of these plates. He used the dullest diffused day-light to impress the plates, and he could pretty correctly hit any colour he desired—the larger the quantity of citric acid employed in the developer, the larger must the exposure be. He found a ten per cent. solution of common salt a splendid restrainer—keeping the bright lines beautifully clear. From extended experiments he, however, had come to the conclusion that as yet no gelatine film was capable of yielding such clear and brilliant transparencies as collodion. He thought, however, for printing on opal, the gelatino-chloride was unapproached for beauty. He preferred to develop a red image, and then tone to the desired colour—the result being one of the prettiest things it is possible to see.

Mr. Alexander Matheson had come to the same conclusion, and he found that when transparencies were thrown on the screen, people with a knowledge of the requirements constituting a good transparency invariably selected those in collodion from any kind of gelatine transparency, as being in some sense more acceptable.

Mr. Forgan had only tried two of Mr. Cowan's plates, and he submitted these. They were both successful.

Mr. Frasier had tried several dozens, chiefly for microscopic work, and found them much superior to bromide plates; and so

simple were the operations and requirements, that he was invariably successful.

Mr. J. M. Turnbull thought those who required a perfect lantern slide ought to fall back on the old collodion-bromide. In every particular the development was exceedingly simple, and as certain as simple, while any desired result could be obtained with ease, every detail being under most thorough control.

Mr. Pringle entirely agreed with these remarks of Mr. Turnbull's.

Hearty votes of thanks to Mr. Simpson and Mr. Cowan were accorded by acclamation.

Mr. J. M. Turnbull exhibited a new slide-carrier which he had picked up in his recent wanderings in the south. He did not know its author, but it was admitted by all present as probably the simplest and most generally acceptable form of carrier for a single lantern that could be found.

Mr. G. Mitchell exhibited a splendid series of views and animal studies, by Mr. Reid, of Wishaw. They were examined with great interest, and greatly admired.

The Secretary submitted what he had found to be a very useful adhesive material, obtainable at a very low price, under the name of "Gloy." He was afraid to recommend it for mounting silver prints, as he had only met with it during the last six weeks, but a silver print coated on both sides with the material had not undergone any change during that time; but for every other purpose he thought it greatly superior to the adhesive materials commonly met with. It dried slowly with a minimum of "cockling," and free from unevenness of body. It was very cleanly in use, practically transparent, and dried with a slight gloss. By the addition of water it could be reduced in consistency, and still retain great tenacity, and it seemed well suited for many purposes where ordinary glue, gum, or starches did not always answer satisfactorily. By the courtesy of Messrs. Fraser and Co. he was able to distribute samples to all who desired to test the material. Several questions were asked as to the constitution of "Gloy," but the only thing definitely announced was that it was a waste product.

Mr. Fraser said that when potato-starch was boiled in a *bain-marie* for several hours, a somewhat similar material resulted.

The Secretary next exhibited a new American camera, which possessed several novel features. The 10 by 8 camera with three double slides only weighed about 7½ lbs.; it was, nevertheless, very strong and rigid. By a beautifully-finished rack arrangement, exceptional length for focussing was available. The bellows were of india-rubber, and all the metal work was nickelled. By an ingenious arrangement the slides could be used vertically or horizontally without altering the position of the camera, and by the simplest of devices the unwitting exposure of the same plate twice was prevented. In reply to a number of questions, the Secretary intimated that Mr. Atkinson, of Liverpool, would answer queries as to other sizes of these cameras.

Cambridge University Photographic Society.

A meeting of this Society was held in Mr. Scott's Rooms, Trinity College, on Monday last; Mr. Scott, President, being in the chair.

The minutes of the preceding meeting having been read and confirmed, Messrs. Turner and Wild were elected members of the Society, and Mr. Pritchard was elected a member of the committee.

The Treasurer then read a statement of accounts, which appeared to be in a satisfactory condition.

The President then called upon Mr. Laurie to read a paper on "Scieneific Photography in 1840."

Mr. Laurie dwelt chiefly on the theory of development, and quoted several experiments by Talbot, Hunt, and others.

A short discussion followed, in which Messrs. Scott, Harrison, and Pritchard took part, and the meeting then adjourned.

Bury Photographic and Arts Club.

The first conversazione since the formation of this Club took place on Tuesday evening, March 11th, at the Temperance Hall, when a very agreeable evening was spent by about 240 ladies and gentlemen. Around the room were placed tables on which were arranged photographs of notable places and choice bits of local scenery, the work of the members, and much of it of the most commendable character. These included views taken in the Fylde district by Mr. C. H. Openshaw, one of the junior members of the Club. Mr. William Booth, Heywood, exhibited views of the Isle of Man, &c., while a large number of photographs of local and other scenery, including an excellent view of the interior of a farmhouse where John Wesley preached, were the work of Mr. J. Nelson. Mr. W. Palmer contributed an oil painting of the old White Lion Inn, Bolton Street, before it was pulled down, and Mr. J. H. Rishton, a number of views on the Wharf. Views of the district through which the river Wyre flows were shown by Mr. R. Grundy, junior. Mr. H. M. Dearden had no less than 30 photographs of bits of local and other scenery, including the interior of the Bury Grammar School. Mr. F. W. Livsey (secretary) contributed 29 views, amongst which were some capital sea pieces produced by the instantaneous process. Mr. W. S. Barlow had several, and Mr. E Eccles a fine case of portraits. The Rev. J. C Horderu sent two excellent water-colour drawings, "April on the Yare, Norfolk," and "Quarry Tramway, Penmaenmawr;" Mr. Shaw also exhibited a figure of Hamlet, the gift of his friend Mr. Henry Irving, and some portraits of Miss Terry, having written upon the back by that lady an expression of thanks for many kindnesses received.

A number of microscopes were lent by Mr. J. Taylor, Mr. E. W. Mellor, Mr. J. Walmsley, and Mr. J. Nelson. Mr. E. W. Mellor lent some beautiful views of the Bermudas and Eastern scenery, and a pencil drawing of Mrs. Langtry by Mr. E. W[illegible], of Sale.

The President opened the proceedings by briefly giving those present a hearty welcome. He remarked that clubs of that kind were doing a useful work. Young people after leaving school, in order to keep out of mischief, should have some hobby, whatever it might be, for their leisure. It was therefore only natural that that those having similar tastes should join together and form clubs such as that was. The bulk of the members of the Club had taken to photography as their hobby, but they did not wish to confine the Club to that; they wished to have their taste improved, and desired those to join the society who devoted their spare time to the brush and pencil in order that they might be told where they had gone wrong, so that their photographic views might be as artistic as possible. He thanked especially the president and members of the Manchester Society for attending.

During the evening songs, glees, &c., were given by a number of the members assisted by several lady friends; and a number of views taken by the members of the Club were shown on a screen by Mr. Walmsley by means of the oxy-hydrogen lantern.

Imperial Russian Polytechnic Society.

The monthly meeting was held on Friday, March 14th.

Lieut. V. Pavloffski explained and practically demonstrated his simplified methods for producing vitrifiable enamels on china, porcelain, opal, &c., and for making photographs on wood, canvas, &c., for engravers and painters.

Mr. Warnerke, in seconding the vote of thanks to Lieut. Pavloffski, said, that what he had seen and heard he was sure would make quite a revolution in photo-ceramics, as such an efficient process must tend to vulgarise both photography in enamel colours as well as upon wood, two branches of the art which are as yet trade secrets, and known only to a few.

Talk in the Studio.

Photographic Society of Great Britain.—The next mid-monthly meeting will be held on Tuesday next, March 25th, at the Gallery, 5A, Pall Mall East, at 8 p.m., and it is expected that Mr. R. Meldola will show a series of slides from his photographs of the Nicobar Islands.

Chromo-Photo-Lithography.—We are glad to receive practical evidence of Mr. W. Griggs having thoroughly reorganized his photo-lithographic establishment after the disastrous fire which we reported some time ago. The two numbers of *The Journal of Indian Art* which Mr. Griggs sends us are certainly magnificent examples of photo-lithographic work Most of the reproductions are, as might be supposed, from hand drawings, but the prints are in some instances in five or six colours. Plate XIV., representing a silver pen-case and ink-stand, is exquisitely rendered in two degrees of silver bronze and black, while it is difficult to speak too highly of the multi-coloured reproductions of enamel and inlaid ivory work.

Professor Rowland.—Professor Rowland, who has recently been presented with the Rumford medal by the American Academy of Arts and Sciences, in recognition of his services in producing the concave refraction grating for spectrum work, now so well-known, tells us something of his adaptation of the grating to the camera. He says:—"Having made the concave grating, I invented a simple arrangement for mounting it, so that a photographic camera should move along the arc of a circle at one end of a diameter, upon the other end of which the grating was placed, and always remain in focus. With this apparatus, one can do in an hour what formerly took days. Moreover, the spectra obtained are always normal spectra, and every inch on a photograph represents a certain number of wave-lengths. After finishing my apparatus, I found it necessary to study photography; and I therefore devoted much time to this subject, and made a special study of all known emulsions. I discovered that an emulsion containing eocene enabled me to photograph from the violet down to the D line; and other emulsions were used for the red rays. I have also been engaged in enlarging my negatives and in printing from these negatives. On these enlarged photographs lines are doubled, which have always been supposed to be single. The E line is easily doubled. My map of wave-lengths is based upon Prof. Charles S. Peirce's measurements of the wave-lengths of a line in the green portion of the spectrum."

Explosions with the Ethoxygen Light.—At the inquest on the Chadderton accident, held on Monday, evidence was brought forward which seems to conclusively prove that the explosion arose from some of the ether being drawn back into the oxygen-bag, and the following is the finding of the jury. "William Heywood was accidentally suffocated owing to the pressure on the stairs caused by a panic owing to an explosion of a mixture of oxygen gas and other vapour in the Town Hall on the 22nd February. They append to their verdict the following recommendations:—1st, The jury are of opinion that the use of eth-oxo. gas should be prohibited at public entertainments. 2nd, That a recommendation be forwarded to the Home Secretary that no persons should be permitted to give exhibitions of explosive gas without a licence for such purpose first obtained." It may be mentioned that a second explosion has just occurred with the ether-oxygen light. It took place at Farnworth, near Bolton, on the 17th instant, but fortunately no serious damage was done.

The Development of Over-Exposed Plates.—It is said that Mr. Sautter, of Geneva, having given some gelatino-bromide plates about 180 times the correct exposure, found that they might be made to yield satisfactory pictures if they were treated with bromide of potassium before development. A ten per cent. solution of the bromide was used, and the plates were allowed to remain in it for one to two minutes. After having been drained for a few seconds, they were developed in the usual oxalate developer, to which a little citric acid had been added.

An innovation, says the *Daily News*, was introduced in parliamentary debate yesterday. Mr. Broadhurst illustrated his speech on moving the second reading of the Leaseholders' Bill by distributing photographs of a tumbledown house. It was labelled, "The Fruits of Life Leases at Malvern."

Photographic Club.—At the next meeting, on March 26, the subject for discussion will be, "The Preparation of Lantern Slides." This being a lantern night, members and visitors are invited to bring slides for exhibition.

To Correspondents.

*** We cannot undertake to return rejected communications.

A. Van Gogly.—1. *Monteur de la Photographie*, published at 13, Quai Voltaire, Paris. 2. The amount is not likely to be less.

E. B. S.—Three articles appeared in our volume for 1882, and they will be found upon pages 166, 246, and 370 respectively.

E. B. D.—1. Many have wished to obtain it, but no method is known at present; indeed, the colour changes if the impression is kept in a dark place for an hour. 2. The best way of working when a particular tint is desired is to adopt the (so-called) carbon process, as the tissue can be made up with a suitable mixture of pigments.

C. C. Lyon.—The most convenient method is the process of double printing to which you refer.

W. Dawson—Either all the negatives must be upon glass of approximately the same thickness, or those on thin glass must be adjusted by placing a few thicknesses of stout paper behind the sensitive tissue.

A. H.—We are glad to have made the matter clear to you, and hope you will communicate with us in case of any further difficulty.

R. Evans.—Details will be found upon page 498 of the last volume of the News, and in the current Year-Book. If any difficulty presents itself in working, do not fail to communicate with us.

Henry Crutchley.—Judging from what you say, we think it likely that the plates recently supplied have been made with a harder gelatine. If this is so, you will have to prolong the development in order to allow the solution to sufficiently penetrate the film.

H. J. D.—Thank you; we will make use of it if we can.

Thos. Widdop.—Thank you very much for the papers.

Ebbw Vale.—The next is that of the Photographic Society of Great Britain. It will open towards the end of September.

Argent Nit.—1. The value of this by itself would probably be nothing, as to extract the silver from such a small quantity of residues would cost more than the worth of the metal. If the whole of the silver originally present in the plates were recovered, it might be worth between one shilling and three shillings. 2. We would advise you to be cautious in making a claim, and to act under competent advice.

W. M. G.—The additions to which you refer are not likely to interfere with the original copyright; but if you wish to secure the additions, a second registration will be necessary.

C. B.—It cannot be accurately described as a new invention, as an instrument almost identical was figured in the fourteenth volume of the Photographic News.

Constant Reader.—2. Traces of soluble chlorides are invariably present, hence the turbidity which arises on adding nitrate of silver. 2. The tissue should have been used soon after it was sensitised, as by long keeping the gelatinous film becomes totally insoluble in water. 3. The single lens will answer admirably; indeed, you could not have a lens better suited for the work.

William Foster.—Nitric acid will dissolve it at once, and the acid need not be very strong. Try a mixture of one part of commercial acid and six parts of water. 2. The portrait is fairly good, but lighted too much from the top.

Beginner.—1. We would not advise you to purchase such an expensive outfit as No. 3 at present, as No. 4 will serve your purpose very well until you have made considerable progress. 2. If we could have but one, we should select the third on your list.

Ruben. J——.—It is the presence of iron oxide which gives it a colour, but beyond this there is no objection to its use.

J. C. M.—It is insoluble in ether, so there is evidently some mistake.

C. Morris.—1. Try very much shorter exposures. 2. Imperfectly cleaned glass. 3. Send us further particulars.

The Photographic News Registry.

Employment Wanted.

Retoucher (Lady), London preferred.—M. A., *Photo. News* Office.
Assistant in Reception Room, &c.—F. S., 58, Belsize-rd., S. Hampstead.
Colourist and Retoucher (Lady).—Theta, *Photo. News* Office.
Photo-ziaco. or Photo-lithog.—E. Beck, 7, Fowell-st., Lancaster-rd., W.
Assistant Operator and Retoucher.—Alpha, *Photo. News* Office.
Retoucher & Assist. Op.—H. Joyce, Saudown-villas, Fisherton, Salisbury.
Operator, wet and dry.—J. H., 38, Lansdown-rd., Dalston.
Assist. Operator & Retoucher.—T. H., 58, Campden-st., Campden-hill, W.
Retoucher (Lady).—Otto Pfenninger, St. Gall., Switzerland.
General Assistant, good all-round.—M. R. C., 49, Ledbury-rd., Bayswater.
Retoucher & Operator.—H. F., 120, Alexandra-rd., Dereham-rd., Norwich.
General Assistant (Lady).—C. F., 35, Lamb's Conduit-st., W.C.
Operator & Retoucher.—J. B., *Photo. News* Office.
Vigaette Printer and Toner.—P. T. F., 4, Wellington-st., Belfast.
Recep.-room, young Lady, experienced.—A. B., 72, Azenby-sq., Peckham.
Assist. Operator (photo's. son).—Z., c/o Mr. Gregory, High-st., Marlboro'.
Oper., Retoucher, &c.—Manager, Taunt & Co., High Wycombe, Bucks.
Recep.-room, Lady, in prov.—Alpha, 10, Kempshed-rd., Albany-rd., S.E.
Gen. Assist., can repair apparatus.—T. Edmunds, 2, Haven-ter., Ealing, W.
Lady, in studio, can tint.—A. H., 15, Arlington-rd., N.
Recep.-room, Spotting, &c. (Lady), first-class.—A. B., *Photo. News* Office.
Printer & Toner, first-class.—Photo. 8, Stile-gr., Gunnersbury, Chiswick.
Assist. Operator, good printer & toner.—E. W., 31, Sutherland-st., Pimlico.
General Assistant, 21/-.—C. S., 7, Jeffries-st., Kentish Town Road.
Recep. Room Lady, exp.—H. Beale, 39, De Beauvoir-rd., Kensington.
Retouch., in or near London.—Retouch., 2, Hanover-pl., Regent's-pk.
Operator or Manager, home or abroad.—A. E. Walker, Eastwood, Notts.

Employment Offered.

Printer and Toner.—E. W. Lavender, Tweedy Buildings, Bromley, Kent.
Photo-lithographer.—Riddle and Couchman, 22, Southwark-bridge-rd., S.E.
Operator & Retoucher. exp.—Personally to W. Phillips, 304, Regent-st., W.
Operator, good all-round, single.—Cuckney & Co., Rochester.
Recep.-Room, Lady, and manage Branch.—J. K., 14, Mildmay-grove, N.
Youth, to be generally useful.—103, Newgate-st., E.C.
Retoucher (Lady).—Universal Printing Company, 280, High Holborn.
Positive work, single man.—R. W. Pitt, Devil's Dyke, Sussex.
Chromo. Printer, lady or gentleman.—Chromotype, *Photo. News* Office.
Junior Clerk.—Letter only to Boning & Small, 22, Baker-st., W.
Printer, Develop Dry Plates, & Operate.—9, Widdicombe-ter., Barking-rd.
Operator & Printer, Landscape work, &c.—Taunt & Co., Oxford.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1334.—*March* 28, 1884.

CONTENTS.

PHOTO-TRANSFERS FOR ENAMELS AND WOOD BLOCKS.

LAST week we announced that Lieutenant V. Pavloffski had communicated to the Imperial Russian Polytechnic Society of St. Petersburg a new and important method of producing photo-enamels, and what, perhaps, is more valuable still, an easy plan of applying photo-transfers to wood blocks. We have now the pleasure of giving our readers the practical details of the process—a most simple one, as they will perceive—and by way of preface we may add, that in support of his process, Lieutenant Pavloffski produced before the members of the Russian Society some excellent transfers of various subjects. The method, therefore, is shown to be a thoroughly practical one, while in further proof, if such were needed of its excellence, we may adduce the opinion of our friend Mr. Warnerke, who was among the audience, and who prognosticates that M. Pavloffski's process is likely to bring about a revolution in the art of photo-enamelling and photo-wood-engraving.

Be this as it may, photographers have, one and all, to thank M. Pavloffski for so generously communicating the working details of his process, and placing at the disposal of his fellow-workers in every land the valuable results of his labours. To produce an effective photograph on wood has been a stumbling block for years past, for although engravers have called photography to their aid repeatedly, the transfer of the photographic film to boxwood is still a matter beset with much difficulty. Let us hope, therefore, that the method now proposed will solve the problem.

We will come at once to the details. The first thing is to prepare the sensitive film. The sensitive compound is thus made up:—

Twenty-five parts of the best picked gum-arabic are soaked for two or three days in 100 parts of distilled water, or in water previously boiled to dispel as much of the air as possible. When dissolved, the gum water is strained through a linen cloth into an evaporating dish. Now take from 16 to 20 parts of vitrifiable pigment, if for transfers to be burnt in, or of calcined lamp black if for transfer to wood, canvas, &c., or for other similar purposes. The pigment or lamp-black must be very carefully ground upon a marble slab or a sheet of ground glass with a few drops of the gum solution; then there is added by degrees 7 parts of crystallized honey. The latter is then stirred into the gum water, and when thoroughly incorporated, 6 parts of bichromate of potash are added, previously dissolved in a little hot water. This mixture, now sensitive to light, is well stirred with a glass rod, and filtered three times through flannel, and finally through dry cotton wool. This solution can be preserved for nearly a week in a dark place.

Patent plate glass, which has previously been cleaned with a weak solution of soluble glass, or received a preliminary treatment with lump-sugar-water, is coated as may be required with the above solution heated to about 190° F. to dispel any air-bubbles it may contain; but these prepared plates do not keep more than two days.

Lieutenant Pavloffski does not regulate the thickness of the film by measuring the quantity of solution, but merely pours a pool of it on the centre of the plate, and allows it to flow all over like collodion; drains the superfluous mixture off at one corner, and as soon as he perceives that the upper end of the plate can be seen through, he places the glass in an horizontal position to dry.

A marble slab heated with hot water, or a drying cupboard, will answer the purpose of preparation, provided that the temperature at which the plates are dried is between 100° and 120° F. Half-an-hour suffices for their complete desiccation. While yet warm, the plates are exposed, the negative being also slightly warmed, and as an extra precaution, the latter should be dusted over with French chalk to prevent it adhering to the sensitive surface. If the negative is not quite flat, thin sheets of mica will be found preferable to plate glass as a support for the sensitive compound.

About one-fifth of the time necessary for a silver print is ample exposure—better more than less, as the development can always be forced in case of over-exposure; but hard pictures are inevitable if the film is under-exposed.

After removing the impressed film from the printing-frame, coat it with a two per cent. normal collodion, and when this is thoroughly set, pour a stream of cold water gently over it. In a few moments the collodion commences to blister; when this happens, take a piece of paper the same size as the plate (but not highly sized nor very thick), and place it, after soaking in water, on the collodion. Then with a needle or the point of a penknife detach the film from two edges of the plate, and raise the corner very carefully. The collodion, carrying the partly developed picture, will adhere to the paper, and can be stripped off and laid film upwards on a clean glass plate, when it is gently sluiced with cold water until it is nearly free from the soluble or unexposed mixture. This particular moment must be carefully watched, and the development retarded by pouring over the impression very dilute spirit (20 parts alcohol to 100 of water); afterwards flood with equal parts of spirit and water, and finally pour on a small quantity of absolute alcohol,* which will completely arrest further development, and the picture is ready for transferring.

Next comes the transfer. To do this, take the enamel tablet or wooden block as the case may be, and lay the picture face upwards on the reverse side of it. Having

* These solutions should be kept ready in three stoppered bottles.

chosen the position the picture is to occupy, cut round with a pair of scissors close to the edges; then wipe the surface of the tablet or block, and coat it with a mixture of 1 part of thick gum mucilage to 3 parts of weak spirit. Pour a little of the same mixture on to the picture, and with an adroit movement, reverse the picture so as to bring it on the surface it is intended to occupy, slightly pressing it with a linen cloth or towel. If the transfer is made to an enamelled tablet, or plate or glass, then the drying can be accelerated by heat; if to wood, ivory, or canvas, then it must be allowed to dry spontaneously. In the latter case, however, the paper support may be removed as soon as transferred.

To wash off the collodion, equal parts of alcohol and ether are used at first, and afterwards ether alone; this dries immediately without having imparted the least humidity to the boxwood block. This last point, it must be remembered, is of very considerable importance, as experienced engravers very well know, for blocks treated with ordinary liquids, although whole and sound enough apparently when put into the engravers' hands, not unfrequently split and spoil during the operation of cutting.

As soon as the ether has evaporated, the picture is ready for the engraver, without any varnish or protective coating being necessary; its hygroscopic character will prevent the film from peeling off or splitting during the operation of cutting, neither does the film, such as it is, offer any resistance to the graver, as his breath alone is sufficient to keep it in a supple condition.

Revenons à nos—transfers. If for enamelling, the collodion can very well remain on them, for Lieut. Pavloffski assures us that the fire consumes it without in the least affecting the resulting picture.

Previous to firing, he applies the glaze in the following manner:—A pad, or dabber of wool, is made, covered with a layer of silk; with this pad you gently apply a very thin and even coating of varnish, prepared with oil of lavender, thickened essence of turpeutine, and an easily fusible glaze, the whole being about the consistency of cream.

The firing is best given over to an experienced person if the photographer is unacquainted with the process; those who undertake to burn in hand-painted tiles, plaques, &c., would have no difficulty in treating photographs, and would scarcely charge exorbitant prices.

As regards the pigments to be used, Lieut. Pavloffsky recommends oxide of copper and gold purple for warm tones, and the oxides of copper and cobalt for cold tones; no admixture of flux or glaze is needed with them.

Another way of applying the glaze is to dab the picture over with the varnish, and dust the glaze over the tacky surface, either from a wide-mouthed bottle with three folds of muslin tied over it, or by using a box like that for strewing powdered resin over copper plates to make aquatinted grounds for etching purposes.

THE PROPRIETORSHIP OF THE NEGATIVE.

Gradually and surely we are getting the law on the side of the photographers. Every case that comes before our tribunals on the subject of the proprietorship of the negative deserves to be carefully noted, and we must beg our correspondents, as much for their own sakes as for our own, to make known to us any decisions of this nature that come under their observation. Lawyers, as everybody knows, go as much by precedent as by equity, and hence it is of the highest importance to place on record every decision pronounced in favour of photographers.

Although we are now in a position to cite some half dozen cases in which the proprietorship of the negative has been decided in favour of the photographer, these decisions have for the most part been given abroad. It is the rarest occurrence to find the matter in dispute in an English court; still we do not remember a single instance in which a photographer—who has not previously bargained to take a *negative* for his client—has been compelled to give up the negative, as part and parcel of a contract entered into to supply photographs. The case decided last week by Mr. B. T. Williams, Q.C., the judge at the Swansea County Court, is not so strong as one in which the negative of an ordinary portrait is involved, but still the dictum of the learned judge is clear enough on the subject, and it is one which our professional readers should bear in mind.

The opposing counsel's contention that the case was on all fours with that of an engineer who charges a customer with a steam engine at £500, and for patterns in making it, £250, and where the customer would have a claim to the patterns, since he paid for them, can in no way be compared to the case of the photographer. Had the latter charged for a foreground for taking the pictures, no doubt the customer might have claimed it; but negatives, as the learned judge remarked, are rather in the category of tools, and a workman does not usually part with these when he sends home his work.

However, for the present, it will suffice to quote the case as it stands in the *Cambria Daily Leader* of March 21:—

Mr. Andrews, photographer, Wind Street, sued Mr. Robert Capper, superintendent of the Swansea Harbour, for £5 8s. 6d. Mr. Monger appeared for plaintiff, and Mr. Glascodine represented the defendant. The claim arose in connection with certain photographs of H.M.S. *Dwarf*, which was in Swansea in September last. Defendant commissioned the plaintiff to execute views of the vessel on her arrival in and departure from the port, together with groups of officers and men on board—an order which the plaintiff duly carried out. He delivered several copies to Mr. Capper, and supplied copies to others. The amount charged was £10 11s. 6d., £5 8s. 6d. of which was for "photographing" the vessel and groups, and £5 3s. for the copies supplied. Mr. Capper paid for the copies supplied, and offered to pay the £5 8s. 6d. if Mr. Andrews handed over the negatives, but the plaintiff claimed that the negatives continued his property. For the defence, it was urged by Mr. Glascodine, that as the plaintiff claimed to charge for executing the negatives, they belonged to the defendant, who gave the order, and charged for making them. The Judge: If you order a photograph, unless you make special terms for the purchase of a negative, the photographer is not entitled to give it up. Mr. Glascodine said if he asked a man to make something for him, and he afterwards asked for copies and paid for them, they were his. If a photographer charged him for taking a negative, did it not belong to him?—The Judge: No! it is part of the instruments used in the business. It is what a photographer uses in his business to make photographs. Why should he part with the instruments of his trade? A negative may be a secret in his trade, and he does not part with it unless there is a contract to that effect.—Mr. Glascodine: Suppose I ask a man to make me an engine for £500, and suppose he charges £250 for the patterns. Do the patterns belong to me or do they not? If he charges me for them, they are mine. If he does not charge me for them, then of course they are not mine.—The Judge: But here he does not charge for the negative. He charges for his work and for copies, and he makes an estimate accordingly. You want photographs for your friends. It does not matter to you how he makes or produces them. There might be other means to produce what you want; therefore what has this to do with you? He charges you for the expense in producing what you want. As I said before, he estimates the cost of producing, but does not sell the material used in production. He wants it for other purposes. If you like, I will give you leave to appeal.—Mr. Glascodine: If so, that will be sufficient. Perhaps you will be good enough to note what I said about the making of an engine and the patterns. —His Honour: Quite so; I find as a fact that the photographer never sold the negatives to the defendant, and I give judgment for the amount claimed with costs and advocates' fees. I give Mr. Glascodine leave to appeal. I think, however, it will be useless to appeal.

PHOTOGRAPHY OF YELLOW AND BLUE IN TRUE PROPORTION OF THEIR INTENSITY.

BY DR. H. W. VOGEL.

It is now more than ten years since that I published an observation of considerable interest—viz., the process of "actinising non-actinic rays," as the late Wharton Simpson called it; or a means to sensitize bromide and chloride of silver for yellow, green, and red rays, by mixing them with certain bodies which absorb the coloured rays mentioned. I made my first experiments with the spectrum of the sun, and succeeded in photographing the red and yellow part of it. My observations and views met, in the first place, with some opposition. My late friend, Monckhoven, doubted them at first altogether. Carey Lea tried to prove that I was mistaken. The first who confirmed my results was Becquerel, the second Major Waterhouse of Calcutta. These gentlemen confirmed the principle pronounced by me in 1873:—*That certain dyes, which have a powerful absorbing action for coloured rays, make bromide of silver sensitive to those rays.*

I proved by further experiments that this action of absorbing agents on bromide of silver is met with only under certain favourable conditions; that is to say, an ordinary chemical sensitizer, which combines easily with bromine, or chlorine, or iodine, and therefore accelerates the action of light on the haloid salts of silver, must be present. For instance, bromide of silver precipitated with an excess of nitrate, well washed, and dyed with fuchsine, is sensisive for yellow and green rays; but if it is precipitated with an excess of soluble bromide, the fuchsine has no action at all. Morphine, pyrogallic acid, and even gelatine, act like a trace of nitrate of silver, and in their presence fuchsine is a sensitizer for yellow rays.

But all these researches were, at first, of merely scientific value for spectrum analysis. Already, in 1873, I tried to take pictures of coloured subjects by stained bromide plates; but I soon observed that bromide plates made sensitive for the yellow rays of the spectrum showed only a trace of sensitiveness for the yellow colour of our pigments. The reason of this was, that the yellow rays of the spectrum are many thousand times more intense than the yellow rays of the most brillant yellow pigment. But I observed (also 1873) that it was possible to get a picture of a dark violet ribbon on a light yellow ground in their true proportion of intensity by the interposition of a yellow glass, which diminished the intensity of the blue rays.

Years past, and yet no useful application came of these observations. Ducos du Hauron and Albert did something in 1877. But they aimed too high; they wanted not to reproduce colours by photographic tones, but by colours again, a task that naturally led them into a sea of difficulty. Albert and Ducos employed for their purpose coloured collodion and coloured glass, using the latter to sift out such colours as they did not want. Cros, in Paris, worked somewhat after the same fashion.

Of late years, an effort has been made to make use of the principle in gelatine photography. Some five years ago I published researches on the subject, showing that gelatine plates could be made sensitive to certain colours. Eosine was found to be the most favourable absorbing medium, a body that had been employed in collodion by all experienced in this branch of photography, having been first proposed for the purpose by Waterhouse. Eosined gelatine plates are already a commercial article, and have been manufactured for some time past by Messrs. Clayton and Tailfer, of Paris. Eosine, I found, materially improves the sensitiveness of the yellow, and lessens the sensitiveness of the plates for blue. This, by the way, is to be observed in other bodies, as, for instance, in fuchsine, and it is precisely this quality, viz.—the increase of sensitiveness for yellow, and decrease for blue—that is of the utmost importance, for without it, in photographing colours, the blue would act as powerfully as the yellow, or, in other words, appear as bright as the latter.

I examined with the spectroscope the commercial eosine plates, and found that for yellow rays they were about double as sensitive as for the blue; their sensitiveness for red, on the other hand, is not greater than in ordinary plates. Still the sensitiveness to yellow was not sufficient to permit the reproduction in their true proportion of intensity of yellow and blue colours together; and for this reason I tried if it were not possible to increase the sensitiveness of yellow still more, as well as to increase also the sensitiveness of red. In both these objects, I am happy to say, I have succeeded, but it is with collodion, and not with gelatine. I am able to produce wet collodion plates which are at least ten times more sensitive for yellow than for blue. With such plates I am enabled, in fact, to reproduce yellow objects in a light tint, and blue ones in a dark tint. All colours, in fact, have an action upon the plates so long as these colours contain yellow and green rays. A photograph taken of the colour-table that appears in my manual gave a most surprising result; the light green came out lightest, yellow was very light indeed, while the blue gave quite a dark photographic tint. I forward you a print from the negative.

A TRIP TO THE GREAT SAHARA WITH A CAMERA.

BY A COCKNEY.*

The railway already goes beyond Sétif on its way to Algiers, but it will probably be two or three years before the line is completed. At present you leave the train at a small town rejoicing in the name of Bordj-bou-Arreredj, where very simple accommodation awaits the traveller, and then take diligence to Ménérville, another station on the line some thirty miles this side of Algiers. You begin coaching at six in the morning from Bordj—I found out you may call it familiarly Bordj for short, if you like, after the manner of Lucretia of that name, though nobody knows this but the townspeople—and you continue your journey through the day and night until six next morning. But it is pleasant travelling, even in the night-time, for the air is never very cold; moreover, there are some magnificent views—the Porte de Fer, for instance, the Gorge de Palaestro, and the snow-tipped Atlas range—sufficient to keep up a keen interest the whole while.

It is something, too, to travel once more in old-fashioned style, in a diligence, after the manner of our fathers, when they did the "grand tour" through Europe fifty years ago, or, to make a more familiar comparison, after the fashion of Mr. Ledbury when he made his first trip to Paris. The bigger diligences here have coupé, banquette, intérieur, and rotonde all complete as in the good old times, and on long journies I should think they are quite as painful and inconvenient as of yore. Still, diligence travel has its advantages. If you are active of limb, you may every now and then get a pleasant walk for a mile or two, while the halts on the road are sufficiently long and frequent to permit of breakfasting and dining in comfort.

As I said before, I think the tourist who carries a camera should be always on the look-out for character rather than nature, and it was for this reason I determined to photograph our diligence at the first opportunity. This occurred at breakfast time, when the two drivers—driving a seven-horse diligence all day long is no joke, so the two men relieved each other every stage—sat down sociably with us and shared the meal. As I wanted to take the machine at the moment of starting, with the driver on the box, ribbons in hand, and the passengers in their places, it was necessary get the driver's good will first of all. Now, many men in this world are nice unassuming

* Continued from page 181.

fellows enough until you ask them a small favour, and then the unexpected position of exercising patronage suddenly changes their nature. Our driver was one of this class, and he suddenly became very official in his demeanour, as soon as I preferred my request. He hummed and ha'ad and really did not know whether he could sanction such a thing. "It won't take two minutes," I urged, as he looked so serious over it all. No doubt he meant to comply from the first, but it would not do to accord permission out of hand. So, after due deliberation, he said: "Pas plus que deux minutes? Eh, bien, soit."

But I had not got the length of my petition. I asked him and his comrade to take their places and have everything ready for the start, that the picture might have some "go" in it. And to facilitate arrangements I mentioned that if he gave me his name, I would send on a copy of the photograph.

But again I failed to evoke any show of enthusiasm. He almost seemed offended, and I thought he might not have understood; therefore, in a smiling mood, I produced a pencil from my pocket to write down his name and address. He took no notice, but gravely drawing a pocket-book from his pouch, handed me a card——

ARCHINARD FILS

Bordj-Bouïra (Algérie)

I bowed and took it, and after this we understood each other much better. The camera was already focused, so that as soon as my friend had taken his seat on the box, I let fall the drop-shutter, reversed the dark-slide, and impressed a second film well within the two minutes for which I had bargained. But had I wished for half an-hour I could have got it, now that the proper relation of passenger to driver was set fast and acknowledged.

This new acquaintance of ours could be sarcastic enough when he chose. He had a difference with the ostlers as to the way they harnessed the horses, and spoke of them as "Messieurs les garçons;" while a native passenger who disputed the fare and handed up a few centimes less than it should be, was asked, what he took him (the driver) for, and whether he thought that he (the driver) had come over to Algeria by the last boat. Still, he was a capital companion to have up in the banquette, and, so long as he was treated with due deference, would answer a question in a most affable manner. For his sake I hope one of those diligence photographs will turn out all right when I come to develop them.

Coming from El Kantara, the mountain fastnesses on the road do not make such an impression on the traveller as would be the case if he were on his way to the interior from the town of Algiers. Still, as I have said, the road presents many interesting features. At Bordj-Bouira (the word Bordj is our burgh or German Burg), where dinner is served about seven, we change vehicles, and thence we see little of the way until Ménérville is reached on the railway.

There was a picture I much longed to take, for it was one that photography could have done justice to; unfortunately, there were more serious objections to its being undertaken than the mere technical one. In the omnibus portion of the vehicle we carried three white-robed Arabs of stately mien and spotless exterior. At day-break, and again at sunset, taking the opportunity of a short halt to refresh the horses, our native passengers got down, and proceeding some twenty paces to the right of the vehicle, they disrobed and engaged in prayer. As they turned towards the declining sun with arms stretched forth and heads lowered to the earth, its glinting rays lit up every fold of their white raiment, and bathed the kneeling worshippers in a flood of lurid light. A truly eastern picture, it was powerful alike in its devout and its artistic character; and somehow it called to mind that group of wandering shepherds who watched from afar the Star of Bethlehem nineteen hundred years ago.

The railway to Algiers furnishes a succession of pleasing panoramas. The deep blue Mediterranean comes into view once more, while the country in many parts is fertile to a degree with its green corn fields, leafy trees, and fresh succulent herbage. Again, as you near the city, bright villas of white stone are seen upon the green hills, with gaily-decked gardens and trellissed vines and orange shrubs with golden fruit still hanging to the stem, while feathery clematis and purple flowering creepers cling to porch and portico. Green cacti hedges and clumps of spear-pointed aloes line the roadways too, and recal the generous tropical climate.

Algiers is never seen to better advantage than when you first sight its white-terraced houses, tier above tier, bordering the sunny bay, the blue water flecked here and there with snowy sails. The Grand Mosque, with its huge white dome, is a wonderful landmark, while the magnificent stone quays—all seen at their best as you come round the bend of the railway—and the fine old-fashioned harbour, compose a superb picture. I don't know why, but the ancient landing-places and arches and quaint water-side steps reminded me directly of the Red Rover and Dick Fid, they were so strange, and yet so familiar. Then, again, the colonnades made up of hotels and cafés, and faced by a broad promenade the whole front of the sea, are a marvellous sight, and the handsome stone buildings, topped here and there by a grim fort, all denote a prosperous and flourishing city. In a word, Algiers is an African Brighton—the very name of the principal restaurateur is Moutton—and serves as an attractive place of resort every year to thousands of Europeans.

From our windows at the Hotel de la Regence there is such a lovely view of the harbour over the top of a group of palms, that my last two plates are devoted to it. It is strange to think, as you look down on the fashionables sauntering to and fro on the polished asphalte, and gaze at the yachts and sleek steamers at rest on the smooth water, that scarce fifty years ago Algiers was the headquarters of piracy, and that slaves—European as well as African—were hard at work, where now monsieur sips his absinthe, and madame and bébé promenade with their white chip bonnets and dainty parasols. Why, even in Captain Marryat's day, a merchantman in difficulties off the Algerian shore was certain to be attacked by pirates, their swift boats lying *perdus* behind the headlands you can see yonder. The Dey of Algiers and his myrmidons seem to have treated all Europeans very impartially; they made no difficulty about sacking and burning any ship they could capture, and selling the crew into slavery. The new order of things only dates from 1836.

Yes, all my films are exposed and my camera work is done. In most cases I have duplicated, for I found, as a rule, so much time involved in selecting a point of view, and arranging the picture, that it would have been unwise not to make as sure as you could by repeating the exposure. It is true I only get half the number of views I might have secured, but still a roving photographer may consider himself pretty fortunate if every other plate gives him a tolerable picture.

At the same time, as I read over the descriptions in my pocket-book, the photographs I have taken seem few indeed. "Ah! but that's not the worst of it," says Jones, to whom I appeal for sympathy. "What's not the worst of it?" is my rather curt reply. I don't want to have a row with Jones; I have kept my temper pretty well, so far, I

fancy, and I shouldn't like just at the end of the trip to come to loggerheads. What I most dislike is that Jones always speaks with a quiet dictatorial manner as if he must be right, he can't help it, and this makes him all the more aggravating. What he now says is, as it were, more in sorrow than in anger.

"What's the worst of it?" I repeat.

"I mean," he continues, "that even the photographs you have taken are not the best bits. It is a pity you didn't go in more for some of the women's costumes we saw at Constantine. And the palm trees at Biskra—you know you didn't take one of those picturesque trees in Landon's garden."

"Go on," I said, keeping myself quite quiet.

"Well, then the Ali Babas you talked about. You haven't a single photograph of a woodcutter with his donkey, nor of a mounted Saracen, nor one of those Aladdin shops with the lanterns hanging up, nor the inside of a harem, nor the hall of a mosque, nor a funeral procession—we saw lots of them—nor a marabout's grave, nor a . . . .

"Go on."

"Well, but now didn't I tell you time after time not to waste a plate, but look out for something better?"

"Yes, after waiting till I had exposed."

"Not always."

"You did."

"I didn't."

"You did."

* * * * * * * * * *

I print no more of this, but simply beg the reader to observe that I had the last word, at any rate.

Algiers with its clubs and cafés and theatres and busy shops, and better still its green lanes, wooded hills, and bright, blue sea, is a delightful residence, and the four days we spent here, after our rougher journey South, were exceedingly pleasant. Altogether it is a much more charming spot than the town of Oran—about twelve hours by rail—to which we next repair on our way homewards. Oran is more Spanish than French, although still in Algeria, and in its architecture and in its inhabitants, you can everywhere trace the Spaniard.

A steamer transports you in nine hours to Carthagena, whence Madrid may be reached in eighteen hours more. I pass over my Spanish experiences, except to say that our small amount of luggage containing sundry parcels of dry plates, got safely past the Custom officers, who on the other hand devoted themselves manfully to a thorough examination of the heavy trunks and bulky luggage with which many of our shipmates were encumbered. I pass over, too, Jones' crushing defeat by the Spanish language, albeit he had given me to understand that a dialogue book he carried would help us through, all standing. For myself, I was never more deceived in my life; he simply knew nothing at all, and his book was always telling what we didn't want to know. For instance, if I asked the Castilian for brandy-and-water—merely out of curiosity to see if he knew it—he would, after five minutes' close study, regret it was not in the book, but that if "my mother has married again" was of any use to me, he would gladly spell it over in Spanish.

In Madrid, Jones was even more unfortunate, for he engaged the services of what is sometimes called an "interrupter," who, though his knowledge of Spanish was vast and profound, had never learned anything beyond his mother tongue.

Madrid—Bordeaux—Paris. In these days of sleeping-cars and express trains, travelling is not only bereft of much of its fatigue, but of much of its tediousness as well, and four days after leaving Oran, I am facing a Customs officer at Charing Cross Station, with my Gladstone bag between us, explaining to him, in the vernacular he and I understood so well, that my camera is not an infernal machine, nor the packets of dry plates, dynamite cartridges.

PHOTOGRAPHY CONSIDERED AS THE WORK OF RADIATION.

BY CAPTAIN ABNEY, R.E., F.R.S.

The fourth lecture of this series was delivered at the Royal Institution on Saturday last.

Referring to the bichromate experiments shown at the last lecture, the Lecturer said they had seen how radiation assisted the destruction of the image by assisting in the combination of oxygen with the reduced silver salt. He would now show them that the visible as well as the invisible image could be destroyed by causing it to combine with oxygen. A piece of blackened chloride of silver paper was then acted upon by peroxide of hydrogen, or hydroxyl.

The image could be destroyed readily by acids, such as nitric, sulphuric, and hydrochloric, as he could show them on bromide paper. In these cases, the sub-haloid salt was split up into the usual haloid compound and silver, the latter combining with the acid. There were other substances as well, that when aided by radiation would destroy the image, such as bromide and iodide of potassium. Plates were then prepared in the bath, washed, and treated with weak solutions of these salts, and then exposed beneath a black and white negative. On being developed in the lantern and projected on the screen, the direct positive pictures came up successfully in both cases. This reaction only took place when oxygen was present, but the action was not altogether unlike that produced by radiation on silver salts, the metal and the halogen of the alkaline bromide or iodide ing separated. He had warned photographers, therefore, of the danger of leaving a soluble bromide in their films.

Radiation alone, continued the Lecturer, was capable of destroying the image, but he could best illustrate this by some experiments of another nature. He had in his hand some tubes containing sulphides of calcium, &c., and after exposure to the electric light, they would see that these tubes emitted light. The rays which produced this phosphorescence he could show by projecting the spectrum on the screen, and holding up a piece of cardboard covered with sulphate of quinine, and still better by the use of paper soaked in a very cheap substance, common lubricating oil. The large phosphorescent tablet which he held in his hand was affected by rays which the eye could not see; the molecules of the phosphorescent compound were set in motion, and emitted light of a somewhat lower refrangibility, which could affect the eye. They would also affect a piece of bromide paper exposed beneath a negative, and he would develop this on the screen before them. Now if he showed the image of a cross or a wide slit upon such a tablet, they could see—or at least those in the front could see plainly—that a bright image was produced. But now, by exciting the table all over first, and then projecting upon it an image produced by red light only, they would see that a black mark was produced, or in other words, the luminosity was destroyed where the red light acted. A series of coloured glasses placed upon a tablet were then exposed to the light, and the glasses were afterwards passed in front of the spectrum to show what kind of light passed through them. The audience could see that the greatest amount of luminosity was produced by the glasses which let through the greatest amount of violet light, and that the tendency of red light was to destroy what luminosity was there originally. Repeating an experiment shown in a previous lecture, Captain Abney demonstrated, by means of repeated puffs of wind on a pendulum, that when these puffs coincided with the rate of vibration of the pendulum, the greater was the pendulum's swing; but if the puffs were otherwise timed, the pendulum was stopped. This represented what took place with the tablet. Throwing the spectrum on a phosphorescent tablet, the decrease of luminosity was shown in the red part, except where the vibrations were the octave of those in the violet. Heat, by increasing the swing of the atoms, made the luminosity greater at first, but the application of ice, on the other hand, slowed down the vibrations for a time. In phosphorescence there was then a visible demonstration of vibration stopped by badly-timed swings.

As he would have to say a great deal about the action of the spectrum, the Lecturer said he would conclude by showing them another way of producing a spectrum than by prisms; this was by means of the grating, the latest and best form being the beautiful grating produced by Professor Rowland, of America. The poles of an arc lamp were charged with lithium, sodium, and thallium, and a brilliant series of spectra, numbering twenty at least, were projected by one grating on to a transparent screen.

A SUMMER HOLIDAY.

BY JOSEPH R. GREATREX.*

On a Friday night in July, two summers ago, I was deliberating on the wisdom or otherwise of going alone to Switzerland on a tour which I had planned out. I had packed most of my requirements, and, although anxious to go, still I did not relish the idea of solitude, when fortune favoured me in the person of a friend who consented to accompany me on twenty-four hours' notice.

My apparatus consisted of a Rouch's whole-plate camera, three double backs; Ross's rapid symmetrical lens, eleven-inch focus; Dallmeyer's rapid rectilinear, eight and a-quarter-inch focus; Dallmeyer's 7¼ by 4½ W. A. P. landscape lens; a Rouch's folding stand, a good supply of Swan's plates, and our esteemed President's collodio-albumen plates. I may here say that during the whole of my travels I have never had the least difficulty with regard to passing the Customs with my photographic kit. The moment I get to the examination room I immediately open my kit and portmanteau, courteously explain that it is a photographic apparatus, that I photograph for pleasure, offer to show ho contents, and never, in the course of my experience, have It had any further prying, but have passed on at once. The Custom officers have a very disagreeable duty to perform, and they can make that duty a very unpleasant one for any shortcomings of courtesy.

We started on the Saturday night with light hearts by the 11 p.m. train for London, and were soon quickly speeding away through the semi-darkness of a summer night. We arrived in the metropolis too early—aye, and had to leave too early—for any chauce of a breakfast; so, having two hours to spare, we whiled away the time by taking a walk along the Thames Embankment, where many a shocking sight presented itself of the wretchedness of men, women, and children asleep on the seats as we strolled along that beautiful summer morn. Unfortunately, I had left my camera at the station, or I should certainly have been tempted to depict this sad state of human existence.

We left about ten o'clock for Dover, and on the steamer we did get something to eat, having fasted nearly sixteen hours. A short, smooth passage, and we were at Calais. There was no time to spare; we started again, through the flat and dreary landscapes of France. A little more patience, and we were at Paris. *Anglais!* The magic word sent us through the Customs without trouble. We stayed in Paris until next day, as we thought it better to break the journey there, our next stopping place being Geneva, the richest and most populous town in Switzerland, and abounding with lovely views, both lake and architecture. The banks of the Rhone are flanked with broad quays and substantial buildings; but the streets, with few exceptions, are narrow, steep, and crooked. Between the Pont du Mont Blanc and the Pont des Bergues is Rousseau's Island. In the centre stands the bronze statue of the wild, self-torturing sophist himself. The national monument also is good, and the Duke gorgeous. They are both well worth a plate or two being exposed on them.

Next morning saw us loading a *voiture* (the driver of which looked like a brigand's apprentice, but turned out a very jolly fellow) with our baggage and selves for Chamounix, *viâ* Bonneville Cluses, St. Martin, and Sallanches. The road traverses the new village of Chêne. A few miles further on the scenery becomes more picturesque. Near Bonneville, on the right bank of the Arve, stands a monument to the natives of the department who fell in the campaign of 1870-71; and on the left, 100 feet high, another to the memory of King Charles Felix of Sardinia. Cluses, the next small town, is chiefly inhabited by watchmakers.

The hills here begin to assume the stupendous height and size which so thoroughly defy the traveller to judge distances in this part of the world. At the village of St. Martin we suddenly obtained a magnificent view of Mont Blanc. A collodio-albumen plate was exposed here from the bridge, which turned out a very fair negative. Passing onwards through Sallanches we came to the small but popular watering-place of St. Gervais-le-Bains, situated in the wooded ravine of Montjoie. The building is something after the Chinese pagoda style, and I exposed a plate on it with success. As we drove along, the glaciers were now visible; but, owing to the vastness of the mountains in which they are framed, it is impossible at first to realize their extent.

At last we arrived at Chamounix, where the hospitable and attentive landlord of the Hotel de Londres received us as brothers, and immediately had us ushered up to our bedroom, a metal plate on the door of which bore an inscription to the effect that it had been occupied by Albert Smith, whose famous caricatures of the "Ascent of Mont Blanc" are so famous. Of course this was too good a chance to be missed, so I photographed Mont Blanc from the window.

Next morning saw us off on mules to Montanvert for the Mer-de-Glace. From this point a magnificent sight presents itself, and finds plenty of work for the camera. The Mer-de-Glace, or Sea of Ice, is a most imposing sight. I exposed several plates on the glacier, also on two pretty waterfalls, and bye-and-by came to the Mauvais Pas. It is a winding foot-path round a precipice, with nothing to hold but some loose iron railings, here and there plugged into the rock with wedges of wood, and perhaps 1,000 feet straight down. I got safely across, and wanted my friend to stand in the middle of the pass while I exposed a plate, but he declined. However, I made one exposure on it when another party was coming over.

We left next morning for Martigny by *voiture*. On our way we made a *detour* to the Cascade-de-Bérard—a picturesque waterfall, in a wild district. I made two exposures here successfully. A "shot" was also made on a pretty village with a rustic bridge in the foreground, which was shortly afterwards passed. Beyond Poyaz the road leads through a valley containing the church of Valorcine, which is protected from avalanches by a barrier of masonry. Pursuing our way we soon afterwards reached the famous rocks of the Tête-Noire. The scenery at this point is indescribably grand and beautiful, and two or three plates may be profitably employed. Proceeding on our journey by a good road we at length arrived at Martigny—a pretty village in the valley of the Rhone.

The next day was spent in visiting and photographing the Gorges-du-Durnant. It is a gorge through which the Durnant is precipitated in a succession of four cascades. The Gorge-de-Trient was another trip. The view is imposing—the rocks, 420 feet high, almost close in over-head, looking like a large cavern. I did not expose any plates here, as it would have required a long exposure, and we had not the time to spare; but I often regretted that I came away without doing so, even had I been compelled to stay another day.

The huge, perpendicular wall of the Gemmi presents the appearance of inaccessibility. When we had climbed two or three thousand feet, and looked for a last view of the place we had left, there was presented the charming view of the bright green level, with a pretty town in its midst, and a silvery stream winding amongst the meadows, the background of gigantic precipices clothed with pines, and above all the snowy domes and peaks of the Monte Rosa region.

On our downward track, which now began, the path lay through a wild and uninteresting country, enlivened only by the pretty alpine flowers, which seem to grow at any height, until we reached the level of vegetation again. Now beauty after beauty began to be unfolded to our view in the most marvellous manner; and oh! for one half-hour without those fleecy clouds now below, then above, and again all round, dancing and drifting in most fantastic beauty, but never leaving us long enough to permit us to have a "shot." The only view I did get was in one minute afterwards, enveloped in cloud and thoroughly hid. However, all things end, and, after eight hours' walking, we reached Kandersteg, where we stayed for the night.

I had some misgivings about the carriage of the baggage on our mule, and felt very anxious about the safety of our plates, which were stored in my portmanteau. As soon as I could, I took the opportunity of examining them, when a deplorable sight presented itself. There were no fewer than fourteen exposed ones broken into fragments. It was very disheartening, and has ever afterwards proved a lesson to me in packing plates. I now invariably cut a quantity of thin card-board angles, and gum one to each corner on the back of the plate. In packing thus they form one solid mass, and I have never had a broken plate since I adopted this method.

From Kandersteg we left next morning, and soon reached the square tower of the ruined Felsenberg, passing the road which diverges to the Blaue See or Blue Sea, picturesquely embosomed in wood, and remarkable for its brilliant effects of colour. The road was now very level, and passing Fellenburg (now a prison), we were soon at Fruitigen—one of the cleanest and prettiest villages I ever saw, situated in a very fertile valley. I took a view of the principal part of the village on a collodio-albumen plate with good success.

* Abstract of a communication to the Manchester Photographic Society.

Interlaken attracts numerous visitors, and is noted for its mild, equable climate. For want of opportunity I only exposed one plate here; it was a view of the English chapel, where nearly every sect alternately hold services.

We were off in good time next morning for Lauterbrunnen, and had not proceeded far when the Jungfrau, with her dazzling shroud of eternal snow, appeared in all her majesty. Close by here is the celebrated Staubbach Fall, which descends in an unbroken fall of 980 feet. I unfortunately could not get a "shot" here, as I had not a lens short enough in focus. Passing along we ascended through a wood to a bridge over the Staubbach; then we crossed two small streams and quitted the wood. Here is suddenly disclosed a magnificent view of an amphitheatre of mountains and glaciers, where we were photographed in a group, after instructing the guide how to uncap the lens and cap it again.

Next morning our journey was Grindelwald and the Eismeer. Grindelwald owes much of its reputation to its two glaciers, which descend far into the valley and are easy of access. To obtain a survey of the glacier a visit should be paid to the Eismeer. A narrow but well-kept path ascends the slope to the left, whence a steep flight of steps descends to the glacier. Two groups were taken here, which turned out very successful. Returning, we diverted to the left to view the ice tunnels, which are very wonderful. A plate was exposed here; and, although it was blowing half a gale, a successful picture was obtained, without blurring, on a collodion-albumen plate. I here wish to remind young amateurs of a very good plan of steadying the camera in strong wind. It is simply to get a large stone, tie a cord round it, and suspend inside the tripod to the screw. There is then no fear of vibration, or of the camera being blown over and damaged.

Next day we turned towards home, taking train for Darlingen, and embarked on the steamboat for Thun. There I got a very good negative of its principal street, on collodio-albumen, although the street was continually alive with people passing to and fro.

ON BICHROMATED GELATINE FILMS AND THE STANNOTYPE PROCESS.

BY W. LANG, JUN.*

Before going on to consider the process by which the mould is obtained, a word or two regarding the special form of tissue that is required may be necessary. To those who may work the process, prepared tissue can be had from Mr. Woodbury. It has very little colouring matter in it. The colouring matter here, as far as the mould is concerned, is superfluous, but it was found necessary to have a little, so as to judge of the developing of the mould. The tissue can be prepared by the amateur should he be so minded, and the formula for preparing the same is:—

Gelatine...	4 ounces
Glycerine	½ ounce
Sugar	180 grains
Water	16 ounces
Colouring as required	

The sugar and glycerine are dissolved in the water, and the gelatine allowed to swell therein. The gelatine must be of an easily soluble kind—Nelson's is recommended. After all is dissolved by heat, the colouring matter—liquid indian ink does very well—is added. The mixture, after filtering, is ready to be poured on to glass plates accurately levelled and previously coated over with ox-gall. The plates can be made into shallow trays by surrounding with pieces of wood, which can be removed so soon as the gelatine has set. The glass plates are then dried in an apartment or drying-cupboard at a temperature of about 70°. The gelatine takes about two days to dry. Sheets of paper cut to the required size are then wetted, and applied to the film by means of a squeegee, and after two hours' further drying, paper will be found adhesive. The tissue can be kept on these glass plates till actually required.

We come now to the sensitizing of the tissue. A six per cent. solution of bichromate is required, and the time of immersion five to six minutes. After sensitizing and allowing to drain, the tissue has to be dried, and as drying by heat is objectionable, as the tissue might be thereby rendered insoluble, a special mode of drying has to be adopted. For this a drying-box with chloride of calcium is necessary. By sensitizing overnight and leaving the box in a somewhat warm room, the tissue should be ready for use in the morning. It is necessary that the chloride of calcium be fresh to give satisfactory results The exposure of the sensitized tissue behind the prepared transparency must be regulated by the photometer; it should be stated, however, that behind the tissue in the printing-frame, a piece of india-rubber cloth or oil-skin paper, such as used in copying letters, should be placed. As to the necessary exposure, experience will be found to be the *sine qua non*. The exposure over the tissue is developed on patent plate-glass collodionized, as in the case of preparing the transparency. After the tissue is squeegeed on to the plate, the glass should be covered with blotting paper, a sheet of glass laid over it, and the whole subjected to some heavy weight. A quarter of an hour or so thereafter, development may be proceeded with. This is a somewhat prolonged process, occupying from about three to five hours. It is evidently a matter of considerable judgment to determine when a mould has been sufficiently washed. The water to be used in the development must be at a temperature of about 110° F. When the mould is sufficiently developed, it is rinsed with hot water, and then in cold. After draining, it is removed to a dish containing fresh methylated spirits, and allowed to remain for several hours. The gelatine is thereby deprived of its water, and on the mould being removed it very quickly dries. Black spots on the mould, due to defects in the transparency, can at this stage be removed, and for this purpose a strip of glass with a clean fracture across will be found most serviceable. The mould is now ready to receive its coating of tin-foil, only before doing so, a solution of india-rubber in benzole is poured over the mould, as in coating a glass-plate with collodion. A thicker solution of india-rubber is passed round the edges of the glass by means of a brush. Having cut a piece of tin-foil to the size of the glass free from holes, the tin-foil and the glass are put together through the rollers of a domestic wringing machine, one with india-rubber rollers. The rollers have to be separated sufficiently far apart in the first instance to allow the glass and foil to enter freely, and when the centre of the glass is between the two rollers pressure is applied, and the glass worked gradually backwards and forwards, extending motion till both edges of the glass be reached. It is necessary to start in the centre of the glass to avoid any bubbles getting between the mould and the tin-foil.

The press claims our next attention, and here it will be seen that Woodbury's mechanical ingenuity comes into play. The mode of using it is as follows:—Having cut a piece of stout blotting-board to the size of the glass, and having steeped it in water and allowed it to drain, it is placed thereon, and all the screws having been loosened, the top part of the press is allowed to lie freely of its own weight on the mould; the press is then closed by pushing the handle forwards, and the screw under the arch of the press screwed up as tightly as possible; thereafter the top screw; and lastly the screw which fixes the ball-and-socket joint. On releasing the handle the top part of the press lifts as a whole, and will always fall back again to the same position. The mould is now greased with a mixture of salad oil and paraffin oil by means of a piece of flannel, and we are ready to draw proofs.

A word as to the ink employed: it is simply gelatine dissolved in water—one ounce gelatine to six to seven parts water, and with colouring matter added to suit particular requirements of each mould.

The photographic tint which we are all so much accustomed to is arrived at by means of a mixture of carmine and indian ink, or alizarine and indian ink. A deep mould requires less colouring matter than a shallow one. The temperature at which the ink should be kept is somewhere about 120° to 130° F. At this stage it may be as well to close this paper, and proceed to throw off a print or two from the mould, which at present is lying in the bed of the press. The mould is not quite such a perfect one as I could have wished, but as I was afraid, on account of the defective light we have lately been having, that I was going to be short-shipped altogether, I was only too glad to get one at all to show at this meeting. Since taking to Stannotype, I have only prepared two moulds altogether, so that I bring forward the process to your notice under somewhat imperfect conditions. Had the light been better than what we have been having lately, I feel justified in saying that more perfect results would have been obtainable. Mr. Woodbury, knowing that I was to communicate something regarding his process to our Society, has very kindly sent down some of his printing moulds; he has also sent down some magnificent examples of Stannotype prints. I think for this attention he should receive our most cordial thanks; I think also you will admit that the work produced is magnificent,

* Continued from page 687.

and that there is a great future for Stannotype there cannot be a doubt. Mr. Woodbnry deserves all success in the process which he has devised, and I am sure the members of the Glasgow and West of Scotland Amateur Photographic Association will join me in wishing him that that success may be of a kind that will benefit himself in no stinted degree.

Notes.

"A Trip to the Sahara," with a few practical details added as to time occupied in travelling and cost of the journey, will he issued next week by Messrs. Piper and Cartel in the the form of a sixpenny pamphlet.

M. Chapiro, the eminent photographer of St. Petersburg, recently hrought to the attention of the Polytechnic Society of that metropolis a novel retouching and preservative varnish, suitahle alike for gelatine plates, as also for making outlines on lantern slides, since it permits of pencilling with the greatest facility. It is composed of 20 parts by measure of a saturated solution of ruhher in benzine, added to 100 parts of ordinary chloroform or amber varnish; it is ready for use as soon as filtered, and is applied without heat. It it said to have a tooth like ground glass.

A modification in the production of glazed photographs —*cartes emaillées*—was hrought forward at the same time by M. Degoe. Instead of collodionising a plain glass surface for imparting the glaze, M. Degoe has hit upon the happy idea of using glass plates etched with a border or frame, or wreath, or other suitable design, which naturally comes out matt in the finished picture. In vignettes, the effect is particularly pleasing, we are told, while, in some cases, the name of the firm had heen impressed. Something analogous to this was attempted a few years ago in the printing of carbon pictures, and should any of our readers desire to make experiments in this direction, glass plates with etched designs of this kind could be obtained very cheaply in this country.

Our colleague, Dr. Vogel, reserves to himself, for the present, the details of the process by which he renders collodion plates more sensitive to the yellow rays than to the blue, but that he has succeeded in solving the difficult problem appears evident enough from a photograph of a colour table which accompanies the communication we have printed in another column. For the reproduction of paintings by photography the process should he singularly useful.

There are no limits to the uses of photography. The latest novelty is the introduction of photographs to give force to arguments in a parliamentary debate. The credit of the idea is due to Mr. Broadhurst, who, as we mentioned last week, on moving the second reading of the Leaseholders' Bill, illustrated his speech by the distribution of photographs of a tumble-down house. It was labelled "The Fruits of Life Leases at Malvern."

It may not he generally known that photographs have been found extremely valuable in the cause of charity. Miss Rye, whose hobby is the exportation of homeless and friendless girls to Canada, has a large album filled with some hundreds of photographs, showing the portraits of *protégées* who have, under her auspices, gone on and prospered. Dr. Bernardo goes a little further. He photographs the street Arab immediately after his capture, and photographs him again after six months' experience or so in the Home. Charitable people, to use a slang expression, are at once "knocked" when they are told to "look on this picture and on that."

Herr L. Giese writes in the *Archiv* on the subject of taking portraits in dining-room and drawing-room. The difficulty, as most of our readers know, is to get sufficient reflection on the shadow side of the model, and for this purpose, it is usual to approach a white screen as nearly as possible to the figure. Herr Giese says that a far more effective reflector is the ordinary dining-room mirror, and he has no difficulty in producing harmonious pictures by means of a five-foot looking-glass. The distance at which the mirror is placed, as also its angle, permits the operator a wide range of lighting, and altogether the dull lustreless effect seen in most "at home" portraits falls away altogether in these circumstances.

A correspondent of a contemporary contemplates something very ambitious in the way of instantaneous photography, hut at present he does not know how to set about it. He says: "I sometimes pass, as I travel hy rail, a picturesque ruin and some pleasing pastoral scenery. I am tempted to ask my photographic friends if I can get satisfactory negatives of those places from the carriage window as I travel along at twenty-five miles per hour? I fancy I can sight the object over the body of my camera as I do a rifle, having an instantaneous shutter flash off the picture." At present photographs of trains in motion have all been taken "end on," and no one has succeeded in photographing one travelling at twenty-five miles an hour "broadside." It matters not whether the camera or the object to be photographed is moving at this rate, and the result would be much about the same—somewhat mixed. But why does not our friend try the experiment for himself? There are no lack either of instantaneous shutters or rapid plates in the market.

Mr. W. Broughton, the inventor of the ethoxo apparatus for lantern exhibitions, writes to the *English Mechanic apropos* of the lamentable accident at Chadderton. His opinion is that the apparatus on that occasion was not one on his principle, as had been asserted, but was one made on the old principle of the wash-bottle, which he had long discarded as being liable to cause an explosion. His opinion is that the explosive compound was not formed in the generator, but in the bag, and not on the evening when the explosion occurred, but on the last time the bag was used. His theory is, that upon the pressure being removed after its last use, the ether entered the tubes and thence the bag; this, on being refilled with oxygen,

formed the explosive compound, and this, together with insufficient weight on the bag, would tend to produce an explosion; for, if the explosive velocity of the gas be greater than the issuing velocity, the flame will travel along the tube.

Turpentine saturated with camphor is, according to the *Scientific American*, a wonderful aid in filing glass. The file should be well tempered, and then, if it is kept wet with this liquid, glass may be filed, it is said, almost as easily as brass; the glass may even, in these circumstances, be fitted into a lathe and worked by the tool.

Next week we shall resume our series of "By-the-Bye" and "At Home" articles.

An important defect in a sunshine recorder now being brought before the public, says a contemporary, appears to have escaped the attention of its makers. It will not record sunshine before 6 a.m., nor after 6 p.m., so that during summer time, several hours' sunshine are often disregarded by the instrument. The reason of the defect is, that though the card-holder has adjustment for any latitude, it does not allow the sunshine to focus through the glass sphere for more than six hours on each side of the meridian. The sunshine recorder, however, is but a rough instrument at the best, and its results are never regarded as scientifically accurate.

The trade in photographic paper has been greater last year than on any previous occasion, if we may trust some of the German returns. The united manufacturers of photographic paper at Dresden, for instance, albumenized no less than 16,100 reams of paper, and sold during that same period 16,545 reams. The nett profit made by this company was 271,251 marks (say £13,500), which is 18,929 marks (£945) more than last year. Another firm of photographic manufacturers, that of P. Berg, acknowledges a nett profit for the past year of 42,160 marks, (£2,108).

"Golden fabric" for the dark-room window is a new material introduced, at the suggestion of Mr. J. W. Zaehnsdorf, by Messrs. Law and Co., the manufacturers of "cherry fabric." Mr. Zaehnsdorf speaks enthusiastically of it, as it allows a flood of clear yellow light to pass without endangering the plate. It is said to be coloured with tri-nitro. naphtol or Martius' yellow. Mr. Zaehnsdorf gave a demonstration with it at the meeting of the Photographic Club on Wednesday exening.

In the New York *Deutschen Apotheker Versammlung*, Mr. S. T. Bendiner recently called attention to a new sensitive compound—namely, a mixture of iodoform and calomel, in the proportion of two parts of the latter to one of the former. Mr. Bendiner exposed five samples to light for six hours—No. 1 under colourless glass, No. 2 under amber yellow, No. 3 under cobalt-blue, No. 4 under black glass, while No. 5 sample was upon white paper, and uncovered. After the lapse of time mentioned, No. 1 specimen became brick red, Nos. 2 and 3 exhibited here and there spots of a dirty red colour. No. 4 was unchanged, and No. 5 assumed an intense dirty yellow tint. Further exposure for three hours brought about no change in No. 4, but Nos 1 and 5 grew more red. The reaction, which probably rests upon the production of iodo-chloroform, goes on more rapidly by heating. We have here, then, another interesting body sensitive to light, with which photographers will no doubt make experiment.

When nearly everybody looks upon being photographed as a mild form of torture, it is refreshing to hear from so eminent an authority as the late Cetewayo that there is a lower depth still. Mr. Whiteley, the "universal provider," has been discoursing concerning his relations with the Zulu monarch. Mr. Whiteley—who, it seems, was commissioned by the Government to "provide" for his majesty during his stay in London—tells us that the most miserable day Cetewayo spent while in the metroplis was that on which he had to sit for his portrait to the Queen's portrait painter. Not knowing what awaited him, the King had gaily consented; "but he had imagined," observes Mr. Whiteley, "that it was a process of photography, and great, indeed, was his disappointment and weariness when hour after hour went by, and still the man with the brush went on with his work." It is to be hoped that the incident here recorded will have the widest publicity, so that sitters may be encouraged when they are asked to remain perfectly still for a few seconds.

Now that the electric light has become familiar in every-day life, it is well to glance back to see how far English philosophers have helped to usher it into being. The first arc-light publicly displayed was that shown by Sir Humphry Davy at the Royal Institution in 1813, when he employed a battery power no less than 2,000 pairs of plates, representing a surface equal to 128,000 square feet. The plates were excited by a solution of alum acidified with sulphuric acid. Faraday it was who, later, at the same institution, showed how magnetism could be converted into electricity, and thus discovered the principle upon which all the powerful dynamo machines of the present day are founded. Finally, the first incandescent lamp, commercially successful, was also that of an Englishman, our friend Mr. Swan, whose invention still holds its own in the front rank. So that, while we do not wish to ignore the many important improvements in electric lighting made on the Continent and in America, British philosophers, it will seem, have at any rate contributed a full share to the invention.

A correspondent who has had a photographic business to dispose of relates his experience. Out of about thirty answers, some eight or nine were written on dirty half sheets of paper and in villainous handwritings. About one-fourth came from residents in London, and the remainder from all parts of the country, showing that the metropolis is still looked upon as the goal of the provincial photographer. On one point, singular to say, all the

writers agree—each one was a superlative operator, and his work absolutely first-class. "I do not fear any competition," writes one, "because I know no one can turn out better pictures." "The quality of my work is the very best, and only a first-rate business would suit me," says another. "I am most particular over every picture I send out, and am certain few can beat me," and so on. If these gentlemen do not overrate their abilities, the fact that out of thirty photographers taken at random, not one is an inferior manipulator, is a most cheering one. But we fear the news is too good to be true.

Patent Intelligence.

Applications for Provisional Protection.

5134. Louis de Roux, residing at Begles, near Bordeaux, Gironde, France, for "Engraving by photography without retouch on my system of metal, which he names 'Cœlator.'"—Dated 19th March, 1884.

5164. Walter Bentley Woodbury, 35, Southampton Buildings, Middlesex, Photographer, for "An improved device for testing the presence of moisture in linen and other articles."—Dated 19th March, 1884.

5353. Heinrich Kayser, Doctor of Philosophy and Lecturer at the University in Berlin, 16a, Neue Wilhelm Strasse, Berlin, Germany, for "Improvements in photographic exchange boxes with sleeve for preventing the penetration of light to the plates."—(Complete Specification.)—Dated 24th March, 1884.

Notice to Proceed.

5464. Albert Kepler, of Peckham, in the county of Surrey, Archille Morin de Bremion, and Alfred Pigeau, of Lombard Street, in the city of London, for an invention of "Improvements in the manner, method, or mode of preparing and producing coloured photographs, and in the arrangements and apparatus employed therefor."—Dated 20th November, 1883.

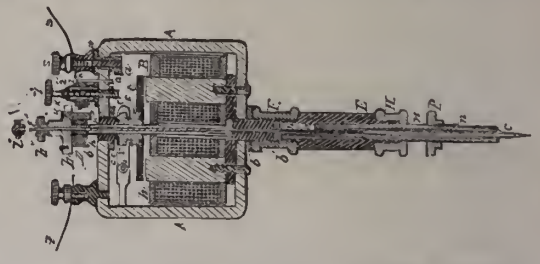
Specification Published during the Week.

3948. Joseph Julius Sachs, of 8, Union Court, Old Broad Street, in the City of London, "Improvements in the manufacture of pliable plates and surfaces as a substitute for Glass for Photographic and other purposes," a communication to me from Messieurs Fickeisson and Becker, resident at Villingen, Baden, Germany.

This invention relates to the manufacture of pliable plates and surfaces for various purposes. These plates or surfaces can be prepared from paper, cloth, or other suitable fabrics or materials, but, by preference, of white paper, which contains very little size, and does not possess much grain. This paper is first extended on a frame, or other arrangement, according to the size of the plate or surface which is desired. After it is dry, the surface is covered in any convenient manner with a fine varnish or composition, such as copal varnish, for the purpose of rendering the fabric transparent. It is then dried, and after it is quite dry, the surface is rendered smooth by the application of powdered pumice stone or other suitable material, or it may be smoothed by suitable machinery. This process of smoothing may be repeated, if necessary, two or three times, until the surface or plate is smooth or transparent. The surface so prepared is then covered on one or both sides with a solution of gelatine or isinglass, or other substance possessing similar properties, and allowed to dry. The surface so prepared may, if desired, be further treated with a preparation of ox-gall, from which the fatty matter has been extracted by acetate of alumina or similarly acting agents, which will precipitate the fat of the gall, the resulting preparation being then passed through a filter, whereby a clear solution will be obtained, with which the plate or surface may be covered, so as to secure the safe reception of the emulsion for photographic or other use. Instead of ox-gall, any similarly acting substance or material may be used. The plates or sheets prepared as above may be used with great advantage in reproducing photographs from nature, in lines or stipples, for calico and other printing, as the stipples or lines can be printed first on the material before it is made transparent. Any photographic design or drawing can be put on the transparent surface in the usual way; and by using the said film as a negative or positive in photographing from nature or from drawing, half-tones will be reproduced in lines and stipples available for any kind of printing. As these plates or sheets are waterproof, they can also be used as surfaces upon which can be printed or produced all kinds of ornamental and useful work. Having now described and particularly ascertained the nature of my said invention, and the manner in which the same is or may be used or carried into effect, I would observe, in conclusion, that what I consider novel and original, and therefore claim as the invention secured to me by the hereinbefore in part recited letters patent is, the manufactnre of pliable plates or surfaces by treating paper or other fabric in the manner hereinbefore described.

Patent Granted in America

294,817. Charles H. Shaffer, Rockford, Ill., assignor of one-half to Jones, Woodruff, and Co., same place. "Retouching-machine." Filed August 11, 1883. (No model).



Claim.—1. The combination, with the tubular shaft, with an armature mounted thereon, and capable of a rotary movement, of a centre shaft supported in the axial centre of the tubular shaft, and capable of an endwise reciprocating movement therein, substantially as and for the purpose set forth.

2. The combination, with the tubular shaft, with an armature mounted thereon and capable of a rotary movement, and with the centre shaft supported in its axial centre, of a clutching mechanism to connect the centre shaft with the tubular shaft, or disconnect it therefrom, substantially as and for the purpose set forth.

3. The combination, with the centre shaft supported in the axial centre of the tubular shaft, and capable of a rotary motion therewith, of a spring within the tubular shaft, and a cam to engage an anti-friction wheel to impart an endwise reciprocating movement to the shaft in its rotary movement, substantially as and for the purpose set forth.

4. The combination, with the spring within the tubular shaft, and a cam mounted upon the central shaft, of an anti-friction wheel having an adjustable support to vary the throw of the shaft in its endwise reciprocating movements, substantially as and for the purpose set forth.

5. The combination, with the anti-friction wheel having an adjustable support, of a spring within the adjustable tubular support, substantially as and for the purpose set forth.

6. The combination, with the adjustable tubular support of the anti-friction wheel, having its base grooved, of a guide-bar to engage the groove in the base of the support, substantially as and for the purpose set forth.

7. The combination, with the cam mounted upon the centre shaft and clutch-head, of a pivoted lever-latch capable of radial position, substantially as and for the purpose set forth.

8. The combination, with the cam and with the clutching-latch pivoted therein, of a spring to hold the latch in its clutching or radial positions, substantially as and for the purpose set forth.

9. The combination, with the cam mounted upon the centre shaft and disengaged from the clutching-head, of an anti-friction wheel supported in the clutch-head to impart an endwise reciprocating movement to the centre shaft, substantially as and for the purpose set forth.

10. The combination, with the centre shaft and with the hand-piece, of a pencil-receiving tube having its projecting end provided with a pencil-holder, said tube suitably connected with the centre shaft and supported in the axial centre of the hand-piece, and capable of a rotary and reciprocating movement therein, substantially as and for the purpose set forth.

A TABULAR STATEMENT OF THE MOST IMPORTANT DISCOVERIES ON THE CHEMICAL ACTION OF LIGHT, AS BEARING ON PHOTOGRAPHY.

BY DR. J. M. EDER.

Although I published in the year 1881 certain fragments of the byegone history of photography in the *Photographische Correspondenz*, there still appear, unfortunately, from time to time, incorrect and imperfect statements concerning many well-known landmarks in our art. I should still have been silent on this subject had not Mr. Robert Hunt, in the Year-Book for 1882, in an article on "Photographic Researches" before Daguerre, repeated some of these data which, according to my experience, are quite untenable, and had there not appeared in the *Photographic Journal* for February (page 81) a "Table showing discoveries regarding action of light, drawn up by R. Hunt, F.R.S., for the British Association in 1850," which on many points runs counter to the information I have myself gained on the subject.

I place the result of my own researches side by side with those of Hunt, so that the fallacy of the latter may be more readily perceived.

Hunt's Table (1850).

Silver.		
Nitrate of	Ritter	1801
— (photographically (employed)	Wedgwood and Davy	1802
— with organic matter	J. F. Herschel	1839
— with salts of lead	J. F. Herschel	1839
Coloride of	C. W. Scheelcs	1777
— (photographically employed)	Wedgwood	1802
	Talbot	1839
— darkened, and hydriodic salts	Fyfe Lassaigne	1839
Iodide of (photographically used)	Herschel	1840
	Ryan	1840
— with ferrocyanide of potash	Hunt	1841
— with gallic acid (calotype)	Talbot	1841
— with protosulphate of iron (ferrotype)	Hunt	1844
— with iodide of iron (catalysotype)	Woods	1844
Bromide of	Bayard	1840
Fluoride of	Channing	1842
Fluorotype	Hunt	1844
Oxide of	Davy	1803
— with ammonia	Uncertain.	
Tartrate, urate, oxalate, borate, &c.	Herschel	1840
Benzoates of	Hunt	1844
Formiates of	Hunt	1844
Fulminates of	Hunt	1844
Silver Plate.		
With vapour of iodine (Daguerreotype)	Daguerre	1839
With vapour of bromide	Goddard	1840
With chlorine and iodine	Claudet	1840
With vapour of sulphur	Niepce	1820
With vapour of phosphorous	Niepce	1820
Glass Plate.		
Precipitates of silver	Herschel	1839
Albumen	Niepce de St. Victor	1848
Collodion	Archer and Fry	1850
Gold.		
Chloride of	Rumford	1798
	Herschel	1840
Etherial solution of	Rumford	1798
Etherial solution of, with ferricyanide of potassium	Hunt	1844
Etherial solution of, with ferrocyanide of potassium	Hunt	1844
Chromate of	Hunt	1844
Plate of gold and iodine vapour	Goddard	1842
Platinum.		
Chloride of	Herschel	1840
— in æther	Herschel	1840
— with lime	Herschel	1832
Iodide of	Herschel	1840
Bromide of	Hunt	1844
Cyanide of	Hunt	1844
Mercury.		
Protoxide of	Uncertain.	
Peroxide of	Guilbourt	—

Eder's Table.

Silver.		
Nitrate solution mixed with chalk gives in sunshine copies of writing	J. H. Schulze (discoverer of photography, Ritter later)	1727
Nitrate solution on paper	Hellot	1737
— photographically used	Wedgewood and Davy	1802
— on silk	Fulhame	1797
	Rumford	1798
— with white of egg	B. Fischer	1812
— with lead salts	J. F. Herschel	1839
Chloride	J. B. Beccarius	1757
— in the spectrum	Scheele	1777
— photographically used	Wedgewood	1802
— blackened	Fyfe Lassaigne	1839
Iodide	Davy	1814
— photographically used	Herschel	1840
— with gallic acid	Talbot	1841
— with ferrous sulphate	Hunt	1844
Bromide	Balard	1826
Sulphocyanide	Grotthus	1818
Nitrite	Hess	1828
Oxide, with ammonia	Mitscherlich	1827
Sulphate	Bergmann	1779
Chromate	Vauquelin	1798
Carbonate	Buchholz	1800
Oxalate	Bergmann	1779
Benzoate	Trommsdorf	1793
Citrate	Vauquelin	1798
Kinate	Henry and Plisson	1829
Borate	Rose	1830
Pyrophosphate	Stromeyer	1830
Lactate	Pelouze and Gay-Lussac	1833
Silver salts in collodion	Le Grey (Archer and Fry)	1850

Same as Hunt's Table

Gold.		
Oxide	Scheele	1777
Chloride on paper	Hellot	1737
— on silk	Fulhame	1794
— in etherial solution	Rumford	1793
— with ferro- and ferricyanide of potassium	Hunt	1844
— and oxalic acid	Döbereiner	1831
Chromate	Hunt	1844
Plate of gold and iodine vapour	Goddard	1842
Platinum.		
Chloride in ether	Gehlen	1804
— with lime	Herschel	1840
Iodide	Herschel	1840
Bromide	Hunt	1844
Cyanide		
Double chloride of platinum and potassium	Döberciner	1828
Mercury.		
Oxide (mercurous)	Gay Lussac and Thénard	1811
—	Davy	1812

Hunt's Table (1850).

Mercury.		
Carbonate of	Hunt	1844
Chromate of	Hunt	1843
Biniodide of	Hunt	1843
Nitrate of	Herschel	1840
Protonitrate of	Herschel	1840
Chloride of	Boullay	1803
Bichloride of	Vogel	1806
Iron.		
Protosulphate of	Hunt	1844
Persulphate of	Herschel	1840
Ammonio-citrate of	Herschel	1840
Tartrate of	Herschel	1840
Attention was first called to the very peculiar changes produced in the iron salts in general by	Herschel	1845
Cyanic compounds of (Prussian blue)	Scheele	1786
	Desmortiers	1801
Ferrocyanides of	Fischer	1795
Iodide of	Hunt	1844
Oxalate of	Hunt	1844
Chromate of	Hunt	1844
Several of the above combined with mercury	Herschel	1843
Copper.		
Chromate of (chromatype)	Hunt	1843
— dissolved in ammonia	Hunt	1844
Sulphate of	Hunt	1844
Carbonate of	Hunt	1844
Iodide of	Hunt	1844
Copper-plate iodized	Talbot	1841
Manganese.		
Permanganate of potash	Frommkerz	1824
Deutoxide and cyanate of potassium	Hunt	1844
Chloride of	Hunt	1844
Lead.		
Oxide of (the puce coloured)	Davy	1802
Red lead and cyanide of potassium	Hunt	1844
Acetate of lead	Hunt	1844
Nickel.		
Nitrate of	Hunt	1844
— with ferroprussiates		
Iodide of		
Tin.		
Purple of cassius	Uncertain	

Eder's Table.

Mercury.		
Oxide (mercuric)	Davy	1797
— more accurate observations	Abildgaard	1797
	Harup not till	1801
Chloride (mercurous)	K. Neumann previously to	1739
—	Harup	1801
Chloride (mercuric)	Boullay	1803
— with oxalic acid	Bergmann	1776
—	Planche	1815
Sulphate	Meyer	1764
—	Buonvicino	1793
Oxalate (mercuric)	Bergmann	1776
— (mercurous)	Harff	1836
Sulphate and ammonia (mercurous)	Yourcroy	1791
Acetate (mercurous)	Garot	1826
Bromide (mercuric)	Löwig	1828
Iodide (mercurous)	Torosewicz	1836
	Artus	1836
Iodide (mercuric)	Field	1836
Citrate (mercuric)	Harff	1836
Tartrate and potassium (mercurous)	Carbonell and Bravo	1831
Carbonate (mercuric)	Davy	1812
Nitrate	Herschel	1840
Sulphide (mercuric)	Vitruvius	1 B.C.
Iron.		
Sulphate (ferrous), first used as a developer	Hunt	1840
— Sensitiveness to light	Chastaing	1877
Chloride (ferric) and alcohol	Bestuscheff	1725
— and ether	Klapproth	1782
Oxalate (ferric)	Döbereiner	1831
Ferrocyanide of potassium	Heinrich	1808
(I could find no reference to Fischer's alleged discovery in 1795)		
Sulphocyanide	Grotthus	1818
Ferrocyanide (Pussian blue)	Scopoli	1783
— further observations by Desmortier		1801
Citrate with ammonium (ferric)	Herschel	1840
Tartrate (ferric)	Herschel	1840
Iodide, used in photography	Hunt	1844
Chromate	Hunt	1844
Copper.		
Chloride (cupric dissolved in ether)	Gehlen	1804
Oxalate with sodium	A. Vogel	1813
Chromate	Hunt	1844
— with ammonium		
Carbonate		
Iodide		
Sulphate		
Chloride (cuprous)	A. Vogel	1859
Copper plates (iodised)	Kratoch	1841
	Talbot	1841
Manganese.		
Sulphate	Brandenburg	1815
Oxalate	Suckow	1832
Potassium permanganate	Frommberg	1824
Peroxide and cyanide of potassium	Hunt	1844
Chloride	Hunt	1844
Lead.		
Oxide	Davy	1802
Iodide	Schönbein	1850
Sulphite		
Peroxide	Gay-Lussac	1811
Red lead and cyanide of potassium	Hunt	1844
Acetate	Hunt	1844

Same as Hunt's Table.

Same as Hunt's Table.

HUNT'S TABLE (1850).

Cobalt.		
Arsenic sulphide of	Hunt	1844
Salts of antimony	Sage	1802
Salts of bismuth	Hunt	1844
Salts of cadmium	Hunt	1844
Salts of rhodium	Hunt	1844
Chromium.		
Bichromate of potash	Mungo Ponton	1838
— with iodide of starch	E. Becquerel	1840
Metallic chromates (chromatype)	Hunt	1843
Chlorine and hydrogen	Gay Lussac and Thénard	1809
Chlorine (tithonized)	Draper	1842
— and æther	Cahours	1810
Glass.		
Manganese, reddened	Faraday	1823
Cyanogen.		
Solution of	Pelouse and Richardson	1838
Methyle compounds	Cahours	1846
Crystallization of salts influenced by light	Petit	1722
	Chaptal	1788
	Dizé	1789
Phosphorous	Schulze	1727
	Ritter	1801
— in nitrogen	Beckman	1800
— and ammonia	Vogel	1806
Nitric acid decomposed by light	Scheele	1786
Fat matter	Vogel	1806
Resinous bodies (heliography)	Niepce	1814
Asphaltum	Niepce	1814
Resin oil of lavender	Niepce and Daguerre	1830
Guaiacum	Wollaston	1803
Bitumens all decomposed	Daguerre	1839
All residua of essential oils	Daguerre	1839
Flowers, colours of, expressed and spread upon paper	Herschel	1842
Yellow wax bleached	Senebier	1791
Influence of light on electrical phenomena	E. Becquerel	1839

EDER'S TABLE.

Various Substances.		
Cobalt	Hunt	1844
Arsenic sulphide (realgar)	Sage	1803
Antimony, sulphide (kermes)	Suckow	1832
Bismuth salts, Cadmium salts, Rhodum salts	Hunt	1844
Iripium ammonium chloride	Döbereiner	1831
Potassium bichromate	Mungo Ponton	1838
— with iodide of starch	Becquerel	1840
Metallic chromates	Hunt	1843
Silver chromate	Vauquelin	1798
Chlorine and hydrogen	Gay Lussac and Thénard	1809
Chlorine (tithonized)	Draper	1842
Chlorine and ether	Cahours	1810
Chlorine in water	Berthollet	1785
Chlorine and ethylene	Gay Lussac and Thénard	1809
Chlorine and carbon-monoxide	Davy	1812
Chlorine and marsh gas	Henry	1821
Chloride and hydrocyanic acid	Sérullas	1827
Bromide and hydrogen	Balard	1832
Iodine and ethylene	Faraday	1821
Cyanogen, solution of	Pelouze and Richardson	1837
Various methyl compounds not mentioned above	Cahours	1846
Hydrocyanic acid	Torosewicz	1836
Hypochlorites (calcium and potassium)	Döbereiner	1813
Uranium chloride and ether	Gehlen	1804
Molybdenate of potassium and tin salts	Jäger	1800
Crystallization of salts under influence of light	Petit	1722
	Chaptal	1788
	Dize	1789
Phosphorous (in hydrogen, nitrogen, &c.)	Bockmann	1800

Schulze, in his treatise, "*Scotophorus pro Phosphoro*," published in 1727, says nothing about phosphorus, but he refers to the sensitiveness of silver salts.

Phosphoretted hydrogen	A. Vogel	1812
Nitric acid	Scheele	1777
Hog's fat	Vogel	1806
Palm oil	Fier	1832
Asphalt	Niepce	1814
Resins (mastic, sandarac, gamboge, ammoniacum, &c.)	Senebier	1782
Guaiacum	Hagemann	1782
Bitumens all decomposed all residues of essential oils	Daguerre	1839
Coloured extracts from flowers	Senebier	1782
Similar colouring matters spread upon paper	Herschel	1842
Yellow wax bleached	Pliny	1 century B.C
Purple dye	Endoxia macrembolitissa	10th century
	Cole	1684
	Réaumur	1711
Oils generally	Senebier	1782
Nitric ether	Senebier	1782
Nicotine	Henry & Bontrou-Chalard	1836
Santonine	Merk	1833

My tabular statement, it will be seen, contains several fresh contributions to the history of photo-chemistry, not previously known. Still, it does not profess, in any way, to be complete. In fact, it includes only the older discoveries, and there is not a doubt that hereafter it will be rendered fuller. The quotations and their sources I have myself personally verified, and I shall be happy, in case any of my readers desire it, to indicate how the same may be substantiated. It is only because I do not wish to take up too much space that I have not included the quotations here. In my "History of Photo-chemistry," they are all published at length.

Correspondence.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

SIR,—Allow me, as a member of the Photographic Society of Great Britain, to call your attention to the inexact way in which notices of many of our meetings are given in the PHOTOGRAPHIC NEWS; and, indeed, as I shall presently point out, the reports which you insert are themselves by no means all that the members of this Society have a right to expect.

You will remember that some years ago the Photographic Society of Great Britain instituted "Technical

Meetings," these being held between the ordinary monthly gatherings; and quite recently the title has been changed to "Monthly Technical Meeting" (I am told that this addition to the name has been made at the suggestion of a Provincial or Suburban Photographic Society, it having been alleged that they held meetings under the original title).

Now what I complain of is this. In speaking of the new intermediate meetings, you frequently allude to them as "social gatherings," "pleasant assemblies," "mid-monthly meetings," &c., &c., while you very seldom use the correct designation. In addition to this, your reports of the Technical meetings are absurdly incomplete, and the mere fact that there are seldom more than fifteen or eighteen persons present, indicates the need of full reports, in order that all those members of the Society who see the Photographic News may be promptly posted up in what goes on.—Yours, &c., Councillor.

March 26, 1884.

OLD LONDON.

Dear Sir,—In your last issue you express regret that so little is known of the publications of the Society for Photographing Relics of Old London, and that there ought to be some public place where these could be seen. Specially you name the South Kensington Museum and the Guildhall Library. You will be pleased to learn that both those institutions, as well as the Library of the Royal Academy, Burlington House, subscribe for them; and a full set, which, including one dozen just about to be issued, amounts to ninety-six, can no doubt be seen at either place. Also a set is always on view at 112, Albany Street, N.W.—Yours truly, Henry Dixon.

PHOTOGRAPHY AND ENGRAVING.

Dear Sir,—Here is a twin picture to the Fine Arts Co.'s complaints. Last year, the Society for Reproductive Arts held an exhibition in Vienna, to which were welcomed not only engravings on metal and wood, but helio-engravings, photo-mechanical prints, &c.—in fact, all that was applicable to book illustration, with the exception of ordinary silver prints. Notwithstanding this special invitation, it appears from the final report of the Exhibition commissioners, just published, that the jury, composed chiefly of painters and engravers, unanimously excluded from participation in the prize awards all methods of reproduction in which photography played a rôle.

Now, photo-mechanical reproductions materially assisted in making the Exhibition a success, yet, although the vice-president of the central commission called the jury together again after its dissolution, to reconsider the matter, they stoutly refused to alter their decision. The reason surmised is, that engravers did not like to openly countenance the photo-engraving methods, since they are such formidable usurpers. Mr. Comyns Carr, in his lectures last year, speaking of Mons. Rousellon's process, said that, in some cases, it surpassed some of the older methods of engraving!

On dit, that some engravers like the process, as one firm I wot of, employ four skilled engravers at high salaries merely to retouch photo-engraved plates.—Faithfully yours, C. Chesterman.

Proceedings of Societies.

The Photographic Society of Great Britain.

A meeting was held at the Gallery, 5a, Pall Mall East, on Tuesday, the 25th inst., Mr. John Spiller, Vice-president, in the chair.

Two queries were found in the question-box. The first referred to Mr. Spiller's method of reducing gelatine negatives with a solution made up of alum, sulphate of copper, and common salt (see the Year-Book p. 68). The questioner wished to know if the solution could be advantageously returned to the stock bottle after having been used.

The Chairman said he thought that, considering the extreme cheapness of the solution, it would be better to throw it away after the first time of using, than to run the risk of any diminished vigour in its action.

The second question had reference to some prints which had been sent to Mr. Ashman. The albumen face had disintegrated, and partly come away during the washing.

Mr. Sebastian Davis thought that the fault might result from the use of a weak sensitizing bath, and the consequent imperfect coagulation of the albumen.

Mr. England suggested that perhaps the paper had been too strongly sized, and that the disintegration was the result of numerous small blisters

Mr. Ashman, however, attributed it to sensitizing in a very cold place, and thought that the solution either partially froze or crystallized, and in doing so broke up the albumen.

Mr. Best showed examples of the distortion which results from the unequal shrinkage of albumenized paper, and it was pointed out that the dry mounting method (Photographic News, 1883, p. 516) affords a satisfactory remedy for the mischief. Two cabinets, one to illustrate equatorial contraction, and the other to show longitudinal contraction, were handed round, and Professor Donkin found that the difference in their length was as 152 to 145.

Mr. Ashman exhibited Mr. Offord's registering frame, which was described on p. 162 of our present volume, and he said it had been very much admired at the last meeting of the London and Provincial Photographic Association.

Mr. W. E. Debenham exhibited a folding lantern in which green oil silk was used in conjunction with yellow paper, the result being satisfactory.

The Chairman read an extract from Dr. Halleur's *brochure* on photography, published in 1854; it referred to Poitevin's gelatino iodide process (published in 1850), and to the undesirability of using common glue. Working details of this process will be found on page 206 of the first volume of the Photographic Society's Journal.

Mr. Meldola's slides of the Nicobar Islands were not shown, but it is intended that they shall be exhibited at the next meeting (April 8).

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 20th inst., Mr. J. Traill Taylor in the chair.

Mr. W. M. Ashman exhibited a printing-frame for securing perfect registration, made on the principle designed by Mr. R. Offord, and described on page 162 of the present volume of the Photographic News. Mr. Ashman remarked that, no matter how many times the opal picture be examined during the process of printing, no loss of sharpness need result.

Mr. A. L. Henderson said the old form, in which springs and a screw are employed for securing the plates, was a perfect nuisance; if the plates are fixed well down in a corner of an ordinary printing-frame, perfect registration would result.

M. A. Cowan understood the advantages gained to be the facility by which small pieces of opal may be printed from any portion of a negative; in the case of large size opals, the pneumatic arrangement would require to be distributed.

Mr. Ashman replied that, when larger sizes than quarter-plates are used, two suction-plates are recommended.

Mr. W. E. Debenham considered the idea very good; but should prefer registering at two points instead of four.

The Chairman was much pleased with Mr. Offord's new departure, which he considered very clever. To be able to print small portions of opal or even transparencies from large negatives is a great advantage, no special size being used; there are many ways in which the principle underlying its construction might be useful to photographers, and he thanked Mr. Ashman for bringing it before their notice.

Mr. Cowan passed round a negative handed to him by Mr. Henderson to test. It received only one-third the exposure required for an ordinary commercial plate; he believed there was a new departure in making the emulsion.

In response to the chairman, Mr. Henderson said his experiments were not ripe for publication; he would complete his experiments, and give the formulæ on another occasion. Replying to further questions, he said the sensitive salt was

obtained by double decomposition, no gelatine, castor oil, gum, or colloid body being present; the gelatine is added after the salt is formed, the temperature being 120° F; the emulsion is then set, and washed thoroughly. By his new plan, bromide of silver is formed in a spongy condition, the solutions used being highly concentrated.

Mr. Cowan said he had only one fault to find with the plates, and that was the thinness of the coating; it was necessary to intensify the plates shown to get a satisfactory print. He used Monckhoven's formula.

Mr. Henderson attributed the thinness to over-exposure.

Mr. Cowan replied that he tried a plate with less exposure, and it was worse; he found in using Monckhoven's intensifier it was necessary that the negative should appear too dense. The best results were obtained in this way.

A conversation then took place on the suitability of *papier mineral* and like substances, to receive a coating of gelatine emulsion either for stripping to obtain pellicle, or as a base for paper negatives. Paper varnished with ordinary spirit varnish, also benzole varnish, and tracing cloth, being advocated.

The Chairman enquired if any present would give their experience with negatives on paper faced with gelatine emulsion—not Talbotypes. With regard to the latter process, he possessed some exceedingly fine negatives taken from inscriptions in the books of a library; one by Fox Talbot being very perfect, showing that granularity sometimes complained of does not operate against the value of the process.

Mr. A. Haddon expected better results to be obtained on gelatino-bromide paper negatives, than with the old Talbotype process, because in the latter case the image is entirely on the surface.

Mr. W. Cole recently saw prints of the same subject from glass and paper negatives; it was necessary to look very closely to say which was the paper negative.

Mr. Ashman said so closely can they be made to resemble each other, that nine persons out of ten select the wrong print when they are placed side by side.

Mr. Moule had no difficulty in making negatives with ordinary bromide paper made transparent with castor oil.

Mr. Briginshaw, in showing a lantern slide in which two very thin glasses occupied less space than some single plates do, dwelt on the advantage of portability which would accrue if thinner plates were in more general use.

A discussion then took place on the quantity of silver extracted from the sensitizing bath with various makes of papers, and long or short floating, Messrs. Ayres, Debenham, Henderson, and the Chairman taking part.

Messrs. R. Chipperfield and F. G. Nicholls were elected members of the Association.

Lochee Photographic Club.

There has just been erected in Marshall Street a new studio for this Club. The studio is an exceedingly neat and commodious structure, and is fitted with all the most recent appliances for the efficient prosecution of the art. On Tuesday evening the formal opening took place, when there was a large attendance of members. Bailie Ogilvie, the President of the Club, occupied the chair, and, in the course of a brief opening address, congratulated the members upon the realisation of their great desideratum—a studio. He referred to the success which had attended the Club since its commencement in April last, the membership at present being thirty. The ample facilities they now possessed for carrying on their photographic studies and experiments would, he had no doubt, be taken advantage of, and the Club in this way would have its efficiency and influence largely extended. They would be all most willing to afford every information and help in their power to beginners who might connect themselves with the Club.

After consideration, certain rules for the guidance of members in using the studio were agreed to by the meeting. Seven gentlemen were also proposed for membership.

Mr. Robert Keir, in proposing a vote of thanks to the Chairman, referred to the great interest he had taken in the development of the Club and in the erection of the studio. But for the Bailie's enthusiastic encouragement of the venture, the Club would not have prospered so remarkably.

Dundee and East of Scotland Photographic Association.

This Society had a special lantern evening on Thursday, 20th inst., at which there was a very large attendance of members and their friends. Mr. J. C. Cox presided.

The principal feature of the exhibition was a lantern slide competition open to members, the number of slides being limited to three each. Voting papers were distributed amongst the members present, and 300 marks were allowed to each voter for each set of three slides.

The following was the result of the voting:—John Mathewson, 4,111; D. Ireland, 3,980; D. Ireland, jun., 3,961; J. Y. Rogers, 2,595; A. Simpson, 2,532; J. R. Wilson, 2,355; W. M. Martin, 2,002.

Many of the slides were on Chapman's gelatine albumen plates, and several on Cowan's chloride plates, the whole, with one or two exceptions, reflecting great credit on the exhibitors.

A lantern exhibition then followed, to which Messrs. Valentine, Mathewson, Ireland, Wilson, Martin, Rogers, Ritchie, and others contributed.

A frame of transparencies kindly sent by Mr. Cowan was shown and very much admired, and several members expressed their determination to make a trial of these plates, which, as yet, are not in general use here.

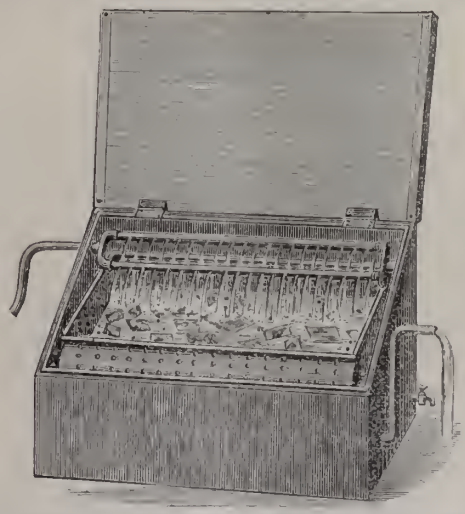
Mr. John Whawdon exhibited and explained a new American camera, embodying a number of ingenious movements.

The usual votes of thanks brought an exceedingly enjoyable evening to a close.

Talk in the Studio.

South London Photographic Society.—At the next meeting to be held at the Rooms of the Society of Arts, John Street, Adelphi, on April 3rd, at eight o'clock, Messrs. C. and F. Darker will exhibit some objects in the lantern polariscope, and the following (from the question-box) will be discussed: "Does the burnishing of prints produce any chemical change in them?"

Marion and Co's New Registered Washing Apparatus.—Messrs. Marion and Co. have recently introduced a new apparatus for washing prints, of which we append a sketch. The great



feature of the apparatus, Messrs. Marion inform us, consists in the rotatory movement of the prints, caused by the system of inflow and outflow of the water. The prints are in constant motion with the water; they circulate continuously in the trough from top to bottom, and never curl together. An hour-and-a-half is said to be sufficient to thoroughly wash them.

A Machine for Wiping Emulsion from the Backs of Plates.—Plate makers have experienced much annoyance from the presence of traces of emulsion on the backs of the plates, this causing adhesion to the levelling slab. Mr. Cowan has recently constructed an ingenious machine, which wipes each plate as it leaves the hands of the coater. The plate is laid over the jaws of a kind of wooden vice, these jaws being clothed with flannel, and as the jaws open, the back of the glass is effectually wiped, after which the plate drops through on the bars of a levelling arrangement. In order that fresh flannel may be used for each

wiping, the covering of the jaws is made to shift onwards about three-sixteenths of an inch after every action of the machine; a ratchet or roller arrangement being used. When the whole of the flannel has been used, it is replaced by fresh, and the old material is washed. The machine is actuated by a pedal which is pressed each time a plate is deposited upon the impress.

PIRATING PHOTOGRAPHS.—William Smith, a wholesale photographer dealer in Vine Street, Minories, was summoned on Friday last, at the Mansion House, for an infringement of the Copyright Act in selling pirated copies of a photograph of Miss Mary Anderson. There were nine more summonses in respect of other photographs. Mr. Foote was counsel for the prosecution, Mr. Tickell for the defence. Evidence was given that the copyright of the photograph in question of Miss Anderson was vested in Mr. Henry Van der Weyde, of 182, Regent Street, and it was alleged that the pirated copies had been sold by the defendant to hawkers at the rate of six shillings per gross. Among other places at which they were sold was the recent World's Fair at the Agricultural Hall, and it was asserted that the defendant when selling them advised that they should not be publicly exposed. Mr. Tickell submitted that the defendant had no guilty knowledge that the photograph was a piracy, and stated that he had sold none since his attention had been drawn to the matter. The Lord Mayor said the defendant had been before the court previously under discreditable circumstances connected with the sale of photographs, and he thought the case was proved. The defendant then pleaded guilty on the other nine charges, the circumstances said to be the same. The Lord Mayor fined the defendant £10 in each of two cases, and £3 3s. costs in each, and respited judgment in the remainder of the charges. The defendant paid the fine. Messrs. Neish and Howell, of Watling Street, write to say that their client, Mr. Henry Van der Weyde, was not, as would appear, the only prosecutor. They wish it to be stated that the defendant was also summoned for pirating copyrights the property of their other clients, Messrs. Poulton and Son, of Lee, Kent, and that he pleaded guilty to three.—*Daily Chronicle.*

PHOTOGRAPHIC CLUB.—At the meeting on April 2nd, the subject for discussion will be "On the best lenses for large portraits on geletine plates."

To Correspondents.

*** We cannot undertake to return rejected communications.

*** ERRATUM.—We mentioned last week that Mr. George Renwick received a silver medal at the Calcutta Exhibition, but we gave his address as Northampton; it should be Burton-on-Trent.

A CONSTANT READER.—We cannot even form a conjecture as to the cause, as we do not know what process you adopted, or anything about your method of working.

X. Y.—1. All depends on the condition of the closet, and the number of plates you put into it. If the closet is thoroughly dry, less time than that you mention will suffice. 2. Yes.

G. BEARD.—Thank you for suggestion, but, as you intimate, the advantages would not compensate for the loss of light and the extreme narrowing of the angle of view which would result from such an arrangement.

DAMP.—1. Your description interests us, and we should like to see a sample. 2. By keeping the moisture in.

H. P. T.—1. Yes, very good indeed; and for ordinary work a simply-constructed piece of apparatus, such as that to which you refer, is very much to be preferred to more complex contrivances. Although there are theoretical reasons for using the shutter in the position of the diaphragm, it is more convenient and more usual to use it in front. We advise you to follow the usual course. 2. If you tell us what lens you intend to use, we may be able to give you some idea. 3. It appears to us that the plate has been generally light fogged. Do you think that your dark-room lamp is safe? 4. Yes, very good.

A. MORRISON.—1. They are printed direct on the glass; it is easier than to make prints on paper. 2. It makes no difference. 3. Our publishers will secure the registration if a print if sent together with a fee of 1s. 6d. 4. Under favourable circumstances it may remain good for a day or two. 5. A sample with a more pronounced grain would be better.

P. S.—It appears to us that the mischief is due to the presence of hyposulphite in the mounts; but see our answer to F. Barrett in the issue of 22nd Feb. last, and read the leader which appears in the same number. If you find the mischief is due to the mounts, you should claim damages against the firm from which you procured them. Let us know the result of your enquiries.

J. S.—1. Yes, quite sufficiently simple for one knowing nothing of the subject. 2. Moderately full directions: remember, it is only a small book. 3. One shilling. 4. Anything from £5 upwards.

A. G. B.—1. You are quite right as to precipitation not taking place under the circumstances you mention. 2. We prefer Eder's for regular work. 3. We think not, but imagine that any plate maker would be willing to enter into such an arrangement.

ASPIRANT.—Mr. A. L. Henderson, of London Bridge, is noted for work of this class. You had better write to him.

J. P.—The main point is to select flat glass. Let us, however, know the exact nature of your difficulty.

PIN.—1. We should suggest that of Asser. 2. It is to be found in the YEAR-BOOK. 3. The details have not been published. 4. No.

J. ADAMS (Liverpool).—1. A photographic portrait of Mr. W. B. Woodbury (taken from the same negative as the picture which you enclose) appeared on page 464 of our volume for 1882, and also in the YEAR-BOOK for 1883 (page 129). 2. We have already given photographic portraits of all the distinguished men to whom you allude, and we have no intention of re-issuing them just at present. 3. The paragraph is interesting, but as we treated of the subject in a leader rather more than a year ago (vol. xxvii., p. 2), we do not care to occupy valuable space with a repetition. It is more convenient to use a solution of hyposulsulphito to which a little sulphuric acid has been added, than to employ a simple solution of sulphurous acid in water. Those who practise the bichromato processes of photography have found our suggestion to be a valuable one, as the stains are removed immediately. 4. There must be some mistake, as the series does not begin with the first volume, but the sixth or seventh; but the complete set of the PHOTOGRAPHIC NEWS (twenty-seven complete volumes) may be referred to at our office. 5. The PHOTOGRAPHIC NEWS is the only weekly Photographic Journal printed and published in London.

A. H.—The apertures are such that if one unit of exposure is required with the largest diaphragm, the following exposures will be required with the remaining stops—No. 1 stop 1 unit, No. 2 stop 1½ units, No. 3 stop 2⅔ units, No. 4 stop 8 units, No. 5 stop 16 units. With a plate of average sensitiveness, and using the largest stop, a second might be required for an out-door group in the shade. Still, the absolute exposure for one stop must be determined experimentally.

HARDWICH'S MANUAL.—In the advertisement of this book in our columns by Messrs. Churchill, the name of the author was printed Hardwick in error; it should, of course, have been Hardwich.

The Photographic News Registry.

Employment Wanted.

Operator & Retoucher.—J. B., *Photo. News* Office.
Vignetto Printer and Toner.—P. T. F., 4, Wellington-st., Belfast.
Recep.-room, young Lady, experienced.—A. B., 72, Azenby-sq., Peckham.
Assist. Operator (photo's. son).—Z., c/o Mr. Gregory, High-st., Marlboro'.
Oper., Retoucher, &c.—Manager, Taunt & Co., High Wycombe, Bucks.
Recep.-room, Lady, in prov.—Alpha, 10, Kempshed-rd., Albany-rd., S.E.
Gen. Assist., can repair apparatus.—T. Edmunds, 2, Haven-ter., Ealing, W.
Lady, in studio, can tint.—A. H., 15, Arlington-rd., N.
Recep.-room, Spotting, &c. (Lady), first-class.—A. B., *Photo. News* Office.
Printer & Toner, first-class.—Photo. 8, Stile-gr, Gunnersbury, Chiswick.
Assist. Operator, good printer & toner.—E. W., 31, Sutherland-st., Pimlico.
General Assistant, 21/-.—C. S., 7, Jeffries-st., Kentish Town Road.
Recep. Room Lady, exp.—H. Beale, 39, De Beauvoir-rd., Kensington.
Retouch., in or near London.—Retouch., 2, Hanover-pl., Regent's-pk.
Operator or Manager, home or abroad.—A. E. Walker, Eastwood, Notts.
Printer & Assist. Operator.—A. S., 47, New York-st., Manchester.
Mounter, Cutter, Spotter (lady).—H. H., 12, Croysland-rd., Chalk Farm.
Printer, Toner, General Assist.—Photo., 3, Alma Cottages, Barking-rd., E.
Retoucher and Operator, first-class.—H. S. Healey, 32, Stall-st., Bath.
Retoucher, Mounter, Finisher (lady).—B. C., 10, Patrick-st., Cork.
Op., &c. (Italian, speaks Fnch. & Eng).—L. S., 35, Grove-lane, Camberwell.
Printer, Retoucher, assist generally.—Argent, *Photo. News* Office.
Retoucher and Assistant Operator.—W. Leuchars, 51a, Perth-rd., Dundee.
Colourist & Ret. (lady).—E. McCowen, 20, Grand Parade, St. Leonards-o-S.
Printer, generally useful.—C. R. M., Station-rd., Sleaford, Lincoln.
Operator and Retoucher, speaks French.—Franco, *Photo. News* Office.
Operator and Retoucher, wet or dry.—X. Y. Z., P. O., Bitton, nr. Bristol.
Retoucher and Assist. Op.—W. H. T., 11, Kirkwood-rd., Haverstock-hill.

Employment Offered.

Positive work, single man.—R. W. Pitt, Devil's Dyke, Sussex.
Chromo. Printer, lady or gentleman.—Chromotype, *Photo. News* Office.
Junior Clerk.—Letter only to Boning & Small, 22, Baker-st., W.
Printer, Develop Dry Plates, & Operate.—9, Widdicombe-ter., Barking-rd.
Operator & Printer, Landscape work, &c.—Taunt & Co., Oxford.
Operator, indoor or out.—C. Gillman, 107, St. Aldate's, Oxford.
Assistant, first-class.—C. Gillman, 107, St. Aldate's, Oxford
Neg. Retoucher (lady), first-class.—W. H. Mason, 89, George-st., Croydon.
Operator, clever at lighting and posing.—Artist, 22, Red Lion Square.
Operator and Retoucher, to manage.—West and Son, Eagle House, Gosport.
Printer and Assistant immediately.—S., 38, Queen's-sq., Bristol.
Neg. Ret., &c.—T. Williams, Talbot-pl., Darlington-st. Wolverhampton.
Operator, skilful & clever Ret.—S. W. Barns, 100, High-st., Ashford, Kent.
Retoucher (lady)), quick, 30/- weekly.—Stuart, 47, Brompton-rd., S.W.
Retoucher, good.—Barraud, 263, Oxford-st., W.
Assistant in Stock-dealer's Warehouse.—Ruby, *Photo. News* Office.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1335.—*April* 4, 1884.

CONTENTS.

GELATINE AS A BROMINE ABSORBENT.

MANY theories have been advanced to explain the difference of sensitiveness which exists between a collodio-bromide and a gelatine emulsion. It has been held that the bromide of silver which is suspended in a collodion emulsion is in a totally different molecular condition from that which is suspended in a gelatine emulsion. The difference in sensitiveness is said by those who hold this theory to be due entirely to this different molecular condition, and to be entirely independent of the suspending emulsion, except in as much as this may tend to bring about the particular condition.

Again, it is pointed out that the restraining property of gelatine is such, that a developer which, without the action of light, would reduce silver bromide either alone or in a collodion film, will not so reduce it in the film of a gelatino-bromide plate. This enables a much stronger developer to be used with a gelatine plate than with a collodio-bromide one.

Another explanation of the superior sensitiveness of a gelatine plate is, that the gelatine acts as a bromine absorbent. This theory is a very plausible one. The action which is imagined is somewhat as follows. It is supposed that the effect of light on a molecule of silver bromide tends to set free one atom of bromine. The amount of light requisite actually to do this varies according to circumstances; and amongst others, according to whether or not there is in proximity to the molecule of silver bromide any substance which will readily absorb the bromine—so to speak, sponge it up. A substance which will do this—or at least, which has an action supposed to depend on its property of doing it—is called a sensitizer, and it is supposed that gelatine is a sensitizer in this sense.

When we come to consider molecular action such as the above, it is very difficult to either prove or disprove a certain theory, and, therefore it is with anything but positiveness that we bring forward certain facts which appear to point out that gelatine does not act as a sensitizer in the manner described, or does so only in a very slight degree.

We have recently been experimenting on the use of free bromine in gelatine emulsions, with a view to the elimination of fog. These experiments we shall not describe in detail at present. The idea of using free bromine to counteract the influence of light is very old—we believe almost as old as the Daguerreotype itself. It was the custom of Claudet, the famous Daguerreotypist, when he noticed that a sitter had moved during exposure, to place the sensitive plate for a few moments in the fumes of bromine, when the effects of the light which had acted upon it were entirely eliminated.

We may say that we have found bromine capable of eliminating light-fog, and also certain varieties of chemical fog from gelatine plates. It is not upon this that we intend to dwell just now, however, but upon the bearing which the use of it has on the theory which is explained above.

Bromine can be had in the form of a heavy fluid of a dark colour, which is very volatile. It is not convenient for use in this form, and a word of warning may not be out of place to those who think of experimenting with it. If it comes in contact with any part of the skin, a very painful sore will result. A drop of this liquid running down the back of the hand will cause a long burn, which will pain for many days.

The fluid bromine is soluble in water, and the solution or mixture generally known as bromine water is the most convenient for practical use. The amount of bromine which will remain in solution varies slightly with the temperature. It is a little less at a high than at a low temperature, on account of the volatile properties of the substance. The difference, however, is not great, and we may take it roughly that a saturated solution contains a little over three per cent. of bromine, or about one part in thirty.

The bromine water may be added to the emulsion during experiment, or the plates may be fumed over some of the water placed in a flat dish. In adding the bromine to an emulsion it is neceseary to bear in mind that it has a powerful action on the gelatine, rendering it insoluble in hot water when present in any considerable quantity. In one experiment which we made, an addition of four minims of bromine water to each ounce of an emulsion totally spoiled it. A much smaller quantity is, however, sufficient to cause the elimination of such fog as is eliminable by its means.

When we commenced our experiments, we concluded that whatever bromine was added to an emulsion must be so completely eliminated, either by washing or otherwise, that there would be no smell of it left. Our argument was, that so long as a plate smelled of bromine, this was proof that there was in the film more bromine than the gelatine could absorb, and that, as a consequence, this latter must have lost such sensitizing action as was due to its power of absorbing bromine.

To our surprise, we found that on adding sufficient bromine water to an emulsion to cause the plates coated with it to smell quite perceptibly of bromine whilst wet, we got no reduction of sensitiveness, or scarcely any. The plates were tested wet, and we supplemented our experiment by impregnating the films of dried plates with bromine by means of the vapour. The result was the same as before. The films which smelled quite perceptibly of bromine were as rapid as those that did not. It is, however, difficult to perfectly distinguish between the smell of free bromine and the odour of certain compounds which may be formed by its action on organic bodies.

It is certainly quite possible to add to an emulsion sufficient bromine (short of coagulating the gelatine) to reduce the sensitiveness of the plates whilst wet. It is found, however, that in such a case, the plates, even when they have been dried, and when by the drying process all the bromine has been eliminated by volatilization, the sensitiveness remains reduced. This seems to point to the fact that the reduction of sensitiveness arises from an action on the gelatine itself, this having been hardened or rendered less absorbent by the developer.

In experimenting with free bromine on emulsions it is necessary to bear in mind that there must be no iodide of silver present. If there is, the only effect of the addition of the bromine is to decompose some of the iodide of silver, forming bromide of silver, and setting free iodine; the effect of the free iodine appears, however, to be very similar to that of free bromine.

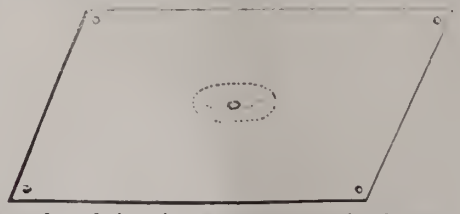
MR. R. OFFORD'S REGISTERING FRAME.

A few weeks ago we described an ingeniously-devised registering frame for printing on opal plates, the invention of Mr. R. Offord (p. 161); and as we have had several enquiries concerning it, we now give two diagrams illustrative of its construction.

The india-rubber sucker, which consists merely of a disc of soft red rubber an inch in diameter, rivetted to the sheet of zinc which takes the place of the back of the frame, is represented below, but the rivet should not project too much inside the sucker. When the face of the

sucker is well anointed with glycerine, a very little pressure serves to make the opal plate adhere firmly; but if the plate is large, it is desirable to have several suckers.

The method of mounting the zinc back in the printing frame is very simple, there being merely four small pins driven into the wood so as to correspond with the four holes in the sucker plate. A printing-frame of the portable



type is used, and the pins are consequently driven in the low part of the framework, just beyond the seating of the back. Mr. Ashman tells us that he has removed an opal plate from the frame no less than six times during an exposure, and no trace of false register was noticable.

THE WOODBURYTYPE PROCESS.

(Fourth Article).

To make a counter mould of the gelatine relief in lead, requires an amount of pressure which is, at first sight, surprising, and we may estimate the pressure required as about fifty tons for a quarter plate picture ($3\frac{1}{4} \times 4\frac{1}{4}$ inch), or two hundred tons for a whole plate ($8\frac{1}{2} \times 6\frac{1}{2}$ inch). In some instances, however, it is desirable to give even more pressure than this.

It is not necessary for us to say much as to the hydraulic press, excepting to say that, if expressly made for the Woodburytype process, a very small rise will suffice, and the bed or platten of the press need be scarcely larger than the top of the ram.

A press suitable for whole plates may be estimated to cost about £50, but a little more will have to be allowed to cover the cost of the steel plate upon which the relief is laid. Suitable presses are made by Tangye Brothers, of Queen Victoria Street, London.

A few words must be said as to the steel plate. It should be fully half-an-inch thick, and must be of the best cast steel or tool steel. After it has been carefully softened by being heated to bright redness, and being allowed to cool very slowly, it is planed all over with as much care as possible; but it is scarcely necessary to say that the photographer will, in most cases, have to send the metal to an engineer to be planed, as a planing machine is not often to be found among the appliances of the photographer's workshop. All round the edge of the plate, and at a distance of about an inch and a quarter apart, are fixed a number of screwed studs, and these should project about an inch. These studs may be three-eighths of an inch in diameter, and well-fitting nuts should be provided for them.

These studs and nuts serve to hold four steel bars in position around the plate, these bars being mitred at the angles so as to form a frame, and they should project about three-eighths of an inch above the face of the plate. A thickness of half-an-inch is ordinarily sufficient for the side strips. The object of these strips is to prevent a lateral extension of the lead on the face next the relief, as any such extension would result in the immediate destruction of the relief. It is well to chamfer off the strips at the top, so that they may penetrate more readily into the sheet of lead than would be the case if they were left square; and in ordinary cases it suffices to bevil them off so as to form an angle of 95 degrees with the outside vertical edge. The planing on the steel plate will not, even if carefully performed, give a sufficiently accurate surface, so it becomes necessary to grind the upper surface of the plate with fine emery and water until the planing marks are removed, and no trace of inequality can be detected when the surface is tested with a surface plate or an accurate straight edge. The emery should be number 150, that is to say, it should have been passed through a sieve having 150 meshes to the linear inch; and the best grinding surface is a thick slab of plate glass, upon the face of which a few grooves about a quarter of an inch wide, and half as deep, have been cut. These grooves hold the mixture of emery and water, and consequently prevent the rubbing surfaces running dry. Care must be taken to shift the steel plate about sufficiently during the grinding, and also to work as much on the edges of the plate glass as on the middle. When the grinding is finished, the plate should be slightly oiled, and the side strips bolted in position. Some pieces of sheet lead, half an inch thick, and about half an inch longer and broader than the steel plate, are now carefully cleaned on the best side by means of a stiff brush, and all is now ready for making the mould.

The relief is laid on the surface of the steel plate, the edge strips being bolted on so as to virtually convert the plate into a tray, a sheet of the cleaned lead is laid over the strips, and this sheet of lead will, if its dimensions are in accordance with our directions, overlap the inner edges of the strips to the extent of a quarter-of-an-inch all round. A piece of stout millboard is now laid over the lead, and the steel plate, with its charge, is brought into a central position on the platten of the hydraulic press, after which the pressure is applied. The side strips easily shear through the lead, thus cutting out a piece which exactly fits the tray, and as the face of the lead next the relief is effectually prevented from stretching by the edge strips, the relief is very seldom damaged by the pressure; no difficulty is experienced in separating the relief from the lead mould.

If the original negative was an ordinary or direct negative, and the relief was laid with the collodion side downwards, a mould will result, which will yield a reversed print. So in ordinary cases a reversed negative must be used, or else the relief must be moulded with the collodion film next the lead.

his latter course results in a very slight loss of sharpness, t so slight as to he unimportant in most cases. This loss sharpness hecomes less when the relief has heen several mes moulded from, as the gelatine side hecomes perma-ently flattened, and the finer details of the relief gradually equire prominence on the collodion side.

Before speaking of the mounting of the block and the inting operation, it is necessary to describe the method of reparing the paper upon which the impressions are to be ade.

CARBON PRINTING.

Lesson I.

Carbon printing is the art of making photographs in pig-ented gelatine, for which purpose the gelatine, after heing ixed with the chosen pigments, is spread upon a somewhat oarse paper, which acts as a support to the gelatine film uring the operations necessary for the production of the rint.

Paper coated with pigmented gelatine is called carbon ssue, and is sold in rolls (or bands, as they are usually alled) containing about twenty or thirty square feet.

To render carbon tissue sensitive to light, it is immersed i a solution of bichromate of potash, and dried; it is then xposed to light under a negative, the duration of such ex-osures heing timed by means of an actinometer, hecause he progress of the action of the light cannot be watched.

The exposure heing effected, the tissue is immersed in cold vater, and then hy means of an india-rubber squeegee is ounted upon a suitable support, either rigid or flexible, and ien, after soaking in hot water, the paper hacking is stripped ff, when the unaltered pigmented gelatine is, hy the action f the hot water, dissolved away, leaving the image upon he support, so much of the pigmented gelatine requisite or the formation of the image having hy the action of light een rendered insoluble in the hot water.

The carbon image, being developed from the hack of the issue at this stage when made from an ordinary negative, vill he found to be reversed in position as regards right and eft, and to get it into its right position it will require ransferring to another support so that the image may he n its proper position, this heing called the double transfer rocess.

But if a special or reversed negative be used, then the rint is at once developed upon its final support, as in the ingle transfer process.

From the above it will be seen that the following are the arious stages through which a carbon print has to go—viz., ensitizing and drying the carbon tissue, printing under a egative, and timing the exposure hy means of an actino-neter, mounting the exposed tissue upon the temporary upport, developing the exposed tissue in the hot water, and hen transferring the developed image from the temporary o the final support; and as each of these several stages re-quires to he thoroughly understood and properly carried out, t will be hest, before proceeding to the actual process of making prints, to deal in detail with each stage. The most mportant stage in the production of a carbon print is dry-ng the carbon tissue after sensitizing, and unless this be effected in a proper manner, all subsequent work is thrown away.

The conditions of success are drying at a moderately low emperature in a room or closet free from all gaseous exhala-ions, and through which can pass a constant stream of pure dry air, and from which all actinic light is excluded.

In dry weather the tissue will dry spontaneously, but in damp, close weather, a slight accession of artificial heat will be requisite; if the drying-room he provided with an ordinary fire stove, a fire for an hour or two will he generally sufficient for such a contingency; but on no account must an ordinary gas stove he used, as the products of combustion are fatal to the solubility of sensitized carbon tissue.

For small batches of tissue no better place for drying can he had than the domestic kitchen after the duties of the day, provided no gas is burnt during the drying, and that white light can he excluded. The time occupied in drying the tissue has a marked influence upon its quality and sensitive-ness; if dried too quickly, besides running the risk of melting the gelatinous coating, it will he comparatively insensitive and very brittle; the prints will also he hard and deficient in half-tone. On the other hand, if dried too slowly, the tissue will he too sensitive, sometimes so much so as to he unmanageable; it will also he tinted or fogged, in which case it may he thrown away, as, with tinted tissue, it is im-possible to get pure whites.

Tissue ought to dry in from six to ten hours; but that dried the quickest will print the slowest, but will keep good longer—*i.e.*, will keep from spontaneous insolubility longer. Sensitive tissue, when dried, ought to he kept in a tin tube so as to protect it from the action of damp, which will soon set up spontaneous insolubility. To dry the wet tissue it is best hung over a clean broomstick, which, in turn, is sus-pended on a couple of cords running the length of the drying room (fig. 1). *a a a a*, two cords stretched across the

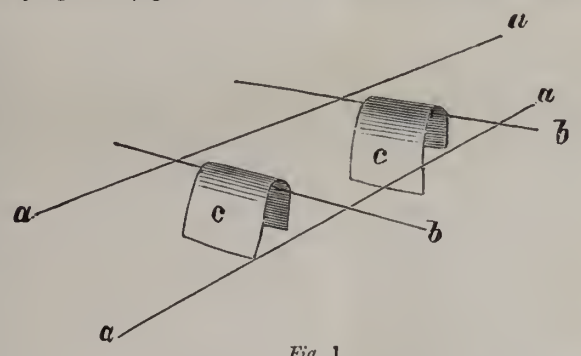
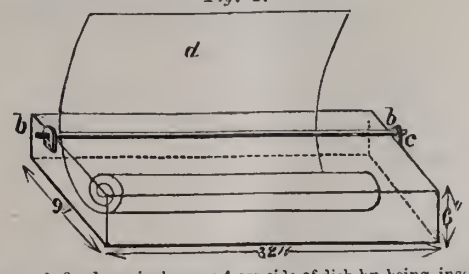


Fig. 1.

room, *b b*, broomsticks carrying lengths of sensitive tissue.

To sensitize tissue we require a tin dish sixteen inches long hy nine inches wide and six inches deep; close to top and near one edge are two holes through which are thrust a glass rod (fig. 2); cut the roll of tissue in two with a saw, and then divide the two resulting rolls into six feet lengths. Place the dish upon the floor, and half fill it with a solution of bichromate of potash, composed of bichromate of potash two ounces, water eighty ounces, liquor ammonia half a dram; dissolve, and filter. Now take one of the rolls of tissue six feet hy fifteen inches, and immerse in the solution,

Fig. 2.



c, glass rod, fixed one inch away from side of dish by being inserted in lugs; *b b*, soldered upon ends of dish; *d*, tissue being lifted out of bi-chromate solution, the face in contact with the roll.

at once commencing to re-roll from the loose end, unrolling from the other, keeping the tissue well under the solution; when the roll has been unwound and re-rolled, repeat the operation again and again for two minutes, or until the tissue gets rather limp; then, with the face next the body of the operator, place in contact with glass rod, taking hold of the end of roll, gradually lift from the solution, dragging the face of tissue in close contact with the glass rod, then place over

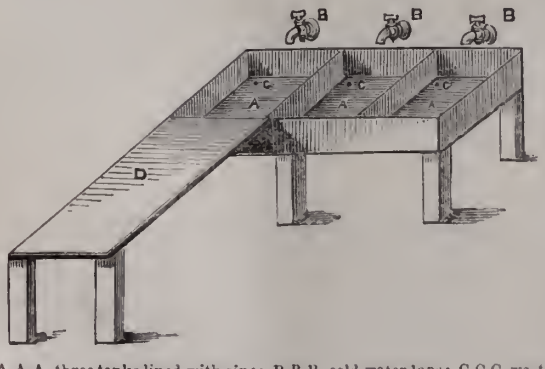
a broomstick, which may be conveniently placed upon two chairs back to back about two feet apart, and remove to drying place (see fig. 2). In hot weather the temperature of the bichromate solution must be kept below 50° F., or else the coating of pigmented gelatine will he dissolved preparing the negative for printing.

Before putting a negative into print, it is necessary to provide a mark or safe edge, arranged in such a manner that without interfering with the subject matter required to show in the print will shield the extreme edges of the tissue from the action of light, so as to provide a safe edge to the tissue, that will be quite soluble in hot water, and absorbent in cold, so that, when mounted upon the development support, the atmospheric pressure will cause the tissue to adhere to the support, and prevent the hot water penetrating between the two surfaces, which it would be sure to do if the edges of the tissue had been made non-absorbent and insoluble by the action of light. Of course, if the print has to be a vignette, no other safe edge is required than the operation of vignetting.

Timing the exposure is done best by means of Johnson's cube actinometer, and the best way of acquiring a knowledge of how to use the instrument is to select a negative of good average density, and place in a printing-frame with a piece of sensitive albumenized paper in contact, and expose to light simultaneously with an actinometer. Now watch the sensitive paper under the slit in lid of actinometer, and shortly it will assume the colour of the pigment painted upon the lid; when this is done, one tint or period is registered; now pull forward the strip of sensitive paper until a fresh surface of sensitive paper is again under the clear slit in lid, and again watch, and when of the same depth as the first, another tint is counted, and so on, until the silver print under the negative has acquired sufficient depth, when the number of tints registered by the actinometer represent the time necessary to secure a fully exposed print from that negative on silver paper; but as carbon is a little quicker, one-fourth less may be safely marked upon the negative, which may be kept as a standard to judge the value of other negatives by.

Mounting the exposed tissue does not require any further comments than those that will come in at the proper time. For the development of the exposed tissue, a good supply of hot water will be required, also a set of sinks or of tin dishes of a suitable size. For those who can spare a room, one fitted like figure 3 will be found very convenient, the

Fig. 3.



A A A, three tanks lined with zinc; B B B, cold water taps; C C C, waste plugs; D, bench for squeegeeing upon.

hot water being supplied either from an ordinary copper or a water heater; but for amateur operations, three tin dishes about 24 by 18 may be substituted for the tanks, and for hot water the kitchen boiler may be requisitioned, especially if it is provided with a self-filling arrangement; whilst, for laying the support and tissue upon for mounting and transferring, a board covered with American cloth will be all that is desired.

By-the-Bye.

ABOUT GRAMMES AND CUBIC CENTIMETRES.

Many of our good old-fashioned notions about the French are disappearing. One by one, they leave us—cherished relics of a byegone age—and before long there will not be a single trait remaining to remind us of the vast superiority of England and all things English. The good old times have gone, indeed, and no wonder we hear on all sides of our decline and fall off. Our fathers despised the French as frog-eaters; to-day, a Paris *chef* receives double the pay of an English professed cook. It used to be a maxim that my Englishman could beat three Frenchmen, as he had done repeatedly at Waterloo, Agincourt, and Fontenoy. Or was it the other way at Fontenoy? No matter, the principle was so evident that illustrations were unnecessary. Yet we find to-day discussions going on at home in military circles in which the British soldier is valued at no more than an ordinary German or Frenchman.

The same levelling spirit is attacking our weights and measures. The metrical system and the decimal system have carried all before them on the Continent; and the Englishman's house, which is proverbially his castle, is in danger of assault. Our insular position has saved us to some extent; but when we find Germany—the natural foe, as she has been termed, of France—quietly and steadily adopting French measures and even French milestones, the end, if slow in coming, is none the less sure. The metrical and decimal systems are certain of adoption by Great Britain, since they have been adopted by all the enlightened nations of Europe. Nay, science, the forerunner of all, has already recognized the innovation in this country, and British chemists and physicists, as everybody knows, no longer calculate by ounce and grain. Science, all the world over, has but one way of expressing figures, and it is evident, therefore, that if photographers desire to be numbered in the world of science, they have no option but to adopt the universal language also.

The first essential of any system of measurement is an unvarying standard. This is obvious. Now the unsatisfactory nature of such variable standards as barleycorns, hands, cubits, and feet, was ofttimes subject for discussion in byegone times, and many were the suggestions of philosophers to select a standard rule. At last, a very sound suggestion came from the French geometricians. "Let us take the earth itself as a standard," they said, and the idea met with almost unanimous approval. One ten-millionth part of the distance from the equator to the pole, measured over the curved surface of the earth, and not in a direct line, like the string of a bow, was selected as the basis, and this was termed a metre. A metre is thirty-nine inches and a-third (39·37), and it was subdivided by the French philosophers into one thousand millimetres, one hundred centimetres, and ten decimetres.

The hundredth of a metre, which is called a centimetre interests us, more especially since it is the immediate parent of the gramme. The weight of a measure of water, exactly one centimetre high, and one centimetre broad, and one centimetre wide—or, in other words, the weight of water that fills a cubical measure of exactly one cubic centimetre—was taken as the new unit of weight. This unit of weight is called a gramme, and hence a gramme and cubic centimetre are one and the same thing when water is concerned. They are to each other as the ounce avoirdupois is to the fluid ounce. To be particular, we ought to mention, perhaps, that the gramme standard was arrived at on the supposition that water is taken at its point of maximum density (4° C).

Since the standard metre and gramme were fixed, there has been some discussion upon the original correctness of the measurements of the earth, and there is very little doubt that the data assumed by the French geometricians are incorrect, and therefore the measure they adopted is

also proportionately incorrect. But this matters little, since no one cares whence a standard is derived, so long as all are agreed to acknowledge that standard. And, as we have said, throughout the whole world of science there is now unanimity on this score. They acknowledge only one measure—the metre; and only one weight—the gramme. Or put it more correctly, perhaps, the universal standards are the gramme and the cubic centimetre.

The old-fashioned photographer, like the old-fashioned chemist, has still a lingering fondness for the old-fashioned British weights and measures; but the belief in them must go as surely as the tradition that one Englishman is equal to three Frenchmen. The simple, universal language of grammes and centimetres is so explicit and so intelligible to all who will bring an unprejudiced mind to bear upon the subject, that it is only wonderful we have stuck so long to ounces, drams, and grains in English manuals. Mr. Arnold Spiller's lessons in elementary photographic chemistry, which we published last year in these columns,* has been translated into several languages, no less because the quantities and measurements are given in grammes and centimetres, than on account of its intrinsic value, great as this may be. A Portuguese rendering of Mr. Spiller's work was in our hands the other day; and in a criticism of the French edition, we read these words:—"En terminant, nous ferons remarquer que M. Spiller, dans ses calculs, se sert des notations du système métrique; il engage vivement ses collégues anglais à renoncer à leur once et à leur grain. Nous ne pouvons qu'applaudir à cette excellente idée, et souhaiter qu'elle se réalise promptement, afin de faciliter l'échange des communications et des formules entre les deux pays."

The International Geodetic Congress, which has recently closed its sittings, and which has come to the conclusion that it would be well if all nations adopted the same longitude calculations, recommending, moreover, that the longitude of Greenwich be adopted by all the world, added a rider to the effect that if this concession were made to Great Britain, then we should no longer stand out of the ring in respect to metrical measurements. In being the only one among the big nations which has not adopted the metrical system, the United Kingdom adopts a stand-still policy ridiculous in the eyes of all intelligent beings. For, as we have said, our advance-guard in the persons of British scientific men have long since seen the advantage of an universal system of measurement, and have not been slow to avail themselves of it.

Still, all changes must be gradual, and the photographer, we must admit, is placed in an unfortunate position. The apothecaries' weights and measures he has by him serve his purpose very well, and as he employs them daily, it is not surprising that when he recommends the use of a new developer or toning solution, he should express the quantities by the measurements he uses every day. Still, there is no reason why, when he is fitting up his laboratory, he should not buy a few gramme weights and purchase a cubic centimetre measure. These are as cheap, if not cheaper, than appurtenances only fitted for use in this country, for a demand for them exists all over the world, and no apparatus maker or dealer can afford to be without them. We repeat, the whole matter is but a question of time and nothing more. All scientific experimentalists among photographers must be conversant with grammes and cubic centimetres, and those who practise much with foreign formulæ require gramme weights and glass measures divided into cubic centimetres. Indeed, the simplest of all methods, as we have before mentioned, for converting fluid ounces into cubic centimetres, or *vice versa*, is simply to pour the liquid from the ounce measure into the metrical measure, and as the latter costs but a couple of shillings, the plan, beyond being a cheap and trustworthy one, obviates many troublesome calculations. In the same way, if you are in possession of a few gramme weights, you can, by weighing them against your British weights, compare them without trouble. But the time will come, and that very shortly, when no such comparison will hinder the photographer's work, and when he, like his senior brother the chemist, will adopt but on measure and one weight in his laboratory.

* "Elementary Treatise on Photographic Chemistry," by Arnold Spiller. Price 6d. Piper & Carter, 5, Castle Street, Holborn.

The "At Home" next week will be "Senor Otero at Madrid."

THE SPECTROSCOPE AND ITS RELATION TO PHOTOGRAPHY.

BY C. RAY WOODS.

V.—The Reducing Action of the Spectrum on the Haloid Salts of Silver, Applied to the Making and Working of Sensitive Films.

Having acquainted ourselves to some extent with the different parts of the spectrum, and glanced briefly at the phenomenon of colour, we are now in a position to examine in detail the action of the spectrum on the principal compounds which the photographer uses. It has already been stated that it is the *most* refrangible portion of the visible spectrum which has the *most* reducing action on sensitive plates; this is only, of course, to be taken in a general sense, for it is found that all compounds, even all silver compounds, are differently sensitive, but the alliterative use of the word "most" may be a useful aid to the memory of the beginner if he is not above accepting artificial aids to his mental powers. Referring once more to the three primary colour sensation theory, and speaking, again, in a general sense, we may regard the sensitive plate as possessing in a transcendent degree only the blue sensation. A once very popular impression, and one that even now exists, to some extent, was that the greatest effect was produced by the rays beyond the violet. How far this is the case we shall soon see; but in the mean time, it may be mentioned, that it certainly appears to be the case so far as the chloride of silver is concerned, the substance whose sensitiveness to light was first noted.

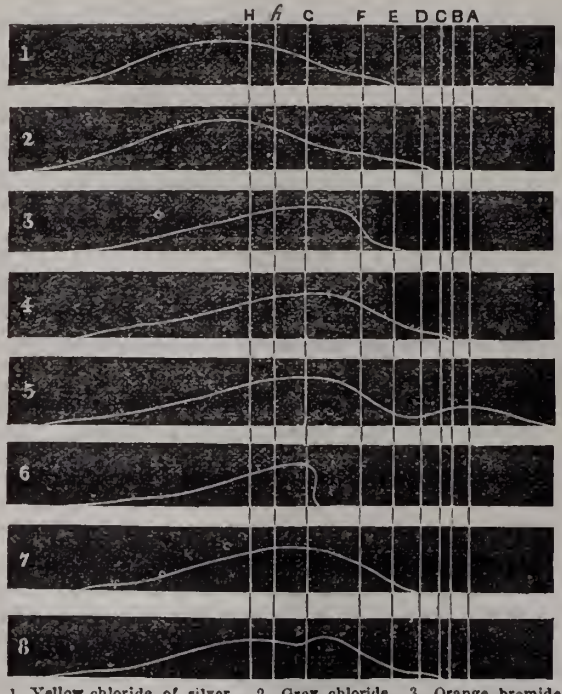
One of the first things that the scientific investigator—aye, and the scientific student, too—has to learn, is to follow the rule that nothing is to be taken for granted. Adopting this principle in the present discussion, and verifying each statement by personal experiment, will not be found a difficult task, when the necessary amount of care and patience is exercised. The mode of procedure, though simple, is worth a brief statement.

The source of light is the first consideration, for it is obvious that the result will vary with the method of illumination. As the light we meet with in nature is emitted by the sun, we need go no further for a source of illumination that shall enable us to make an examination that may go fairly in hand with our ordinary photographic experience. Directing a beam of sunlight on to the slit of the spectroscope by means of a mirror, and condensing the rays on to the slit by means of a lens, in order to shorten exposures, a plate is placed in the dark slide of the camera, and exposed and developed. Assuming that the plate has had sufficient exposure to receive all that it can receive, what do we notice? Leaving out of consideration the Fraunhoferic lines—or rather, using them as an index only—it will be noticed that the image possesses different shades, a gradation of density falling away on both sides of some particular region. This gradation of density gives us a rough idea of the relative sensitiveness of the medium to different parts of the spectrum. To get a more accurate notion, a few more exposures are necessary. A very rapid exposure will show what part of the spectrum produces the greatest effect, for that part will be the first to be impressed. A little longer exposure will show what part is next easily impressed, and so on. By this means we are able to get a very correct notion of the action of different parts of the spectrum on the particular kind of plate that

is being used, and by combining these photographs, representing the action of each part of the spectrum by a line proportionate to its intensity, and drawing a curve upon them, we get a very graphic representation.

The investigation of the action of the spectrum on substances sensitive to light has been followed up from the earliest days of photography. It may be said to have begun before the days of photography or spectroscopy, for when, in 1777, Scheele stated that the violet rays had the greatest blackening action on silver chloride, he had only the impure spectrum as given by Newton's experiment to work with, and, as the reader knows, it was not for many years after that date that the first delineation of an object was produced by the action of light. To give an account of all that has been done since then has formed the subject of a book only receutly,* and those who appreciate that book most, must regret its brevity. In these articles only a few of the best known compounds and combinations can be spoken of, and only the most recent researches. Not long since, a careful examination of the haloid salts of silver was made by Captain Abney,† and the effect of the spectrum was graphically, as well as verbally, delineated by him. The accompanying diagram

Fig. 8.



1. Yellow chloride of silver. 2. Grey chloride. 3. Orange bromide. 4. Grey bromide. 5. Green bromide. 6. Pure iodide. 7. Iodide, bromide with nitrate of silver. 8. Iodide and bromide in gelatine.

gives the result of an examination of those compounds in which the general worker will be most interested. Captain Abney's results do not differ very materially from the work of others in this direction, and the reader cau readily test them for himself.

Chloride of silver, in its yellow state, it will be noticed, has its maximum near H, which is about the extreme limit of the visible spectrum. It is sensitive far up into the ultra-violet, and in the lower part of the spectrum it comes down to about F, its sensitiveness thus stopping short at about the commencement of the green. The grey form of chloride—that is to say, a chloride emulsion which has been boiled—is most sensitive at the same place as the unboiled, but it is sensitive to a greater range of the spectrum, the boiling of the emulsion having made it sensitive as far as D. Bromide of silver is most sensitive midway between G and F, well into the dark blue. The orange or unboiled emulsion, whilst its maximum is in the same place as that of the grey form produced by boiling or by the ammonia process, only goes down as far as E, about the middle of the green, whereas the grey extends as far as B in the red. Pure iodide of silver is most sensitive at about G, and the curve ends very sharply. The addition of bromide makes it extend much lower, and when further reinforced by the presence of free nitrate of silver, as in the wet plate process, we get a considerable range of sensitiveness. With a mixture of bromide and iodide in gelatine we get two maxima, the most sensitive point, as might be anticipated, coinciding with that of pure bromide. At the point where the maximum of the iodide should be, we get a depression in the curve, the mixture of the two salts being less sensitive there. In this curve, however, we have the result produced when a considerable quantity of iodide is present; in the emulsions contaiuing iodide, which the photographer usually works with, the loss of sensitiveness at G is comparatively small and scarcely appreciable, so far as his work is concerned.

Now several questions arise in looking at the different effects produced on different salts. First of all, there is the consideration of what kind of plate will be the best for photographing a particular part of the spectrum, supposing we are making spectroscopic researches in which we are calling in photography to help us. This, so far as the substances already considered are concerned, is a simple matter, and need not be dwelt upon. It is obvious that chloride, if we succeed in getting it in its most sensitive state, whilst we can also develop it free from fog, is the best for work in the violet and ultra-violet portion of the spectrum. For rays below G, and for all-round work, the bromide is the best. Again, if we are using the wet collodion process, it is plain that a mixture of bromide and iodide will give us far better results than iodide alone. Secondly, we have to consider what salt is best for ordinary photographic work, and in what ways may the different salts be utilized in order to work to the greatest advantage. In connection with this it is necessary to consider the question of atmospheric absorption so far as it effects the light that impresses the image. Lastly, there is the action of heat upon a sensitive salt in the preparation of plates, and the application of spectroscopic research in settling doubtful points. These last two questions, however, must be left over for the next article.

* "The Chemical Effect of the Spectrum."
† Proceedings Royal Society.

PHOTOGRAPHY CONSIDERED AS THE WORK OF RADIATION.

BY CAPTAIN ABNEY, R.E., F.R.S.

The fifth lecture of this series was delivered at the Royal Institution on Saturday last, March 29th.

Having in the last lecture shown how the application of heat increased the amplitude of vibration in the case of the phosphorescent tablet, the Lecturer said he would now proceed to show that an exactly similar effect could be, and in the ordinary course of photographic practice was, often produced on a gelatine plate. Taking a dry gelatino-bromide plate, he placed a hot iron on the back of it for a short time, and while the plate was still warm where the iron had been, a very brief exposure was given with a match. On being developed, the plate showed a black smudge where the hot iron had been, the remainder of the plate being under-exposed. This meant that gelatino-bromide plates were more sensitive in hot than in cold weather, and in summer than in winter.

The Lecturer then proceeded to demonstrate the effect of radiation of different wave-lengths by exposing various sensitive substances to the action of the spectrum. Chloride, bromide, and iodide of silver papers were placed in the spectroscopic camera, and developed before the audience, the chloride going most into the ultra-violet, and the iodide giving the shortest range of chemical action by the spectrum. Films of chloride, bromide, and iodide were then placed in front of the slit in a lantern, projecting the spectrum on a screen, to show what parts

of the spectrum they cut off. In all cases, said the Lecturer, they would notice that work was done where absorption took place. To this rule he knew of no exception. It was just the same with other compounds. Ferric chloride, uranium chloride, and bichromate of potash all showed, as they could see on the screen, an absorption in the regions of the spectrum which affected them.

A series of coloured media were then placed before the slit, to show on the screen the absorption that took place. Different forms of bromide were then placed in the ordinary projecting lantern to show their colour, which had a marked connection with the part of the spectrum that acted upon them. One form, which was distinctly green, was used, said the Lecturer, for photographing the red and ultra-red portions of the spectrum.

Referring, then, to an experiment in the second lecture which had failed, the Lecturer said that this failure had rankled in his mind, and he would like to make amends by explaining how it happened. On being placed in the cell containing the developer, the strong light of the lantern completely fogged the plate, they would recollect. He now had in his hand the piece of yellow glass which was used on that occasion, and he would take a photograph in the spectroscope of the light which passed through it. As they would see, he got a considerable quantity of blue light through, and it was little wonder, then, that with such a glass a failure took place when a film was developed under the exacting conditions required to project its development on the screen.

To return to the green form of bromide, he would now take a photograph in the infra-red region of the spectrum. This was successfully done. The lecture was concluded by the taking of a photograph of the carbon points of the electric arc through a sheet of ebonite, and developed up successfully. Here, said the Lecturer, was work done by invisible rays below the red, for they could see that the ebonite was perfectly opaque to radiation which affected the eye.

FRENCH CORRESPONDENCE.

Taylor's Shellac Process—Laboratory of the Museum of Decorative Arts—Printing Process on Copper for Engraving—M. Placet and MM. Goupil and Co.

Taylor's Shellac Process.—In the year 1866 one of my friends of English origin, Mr. Arthur Taylor, published a process which was taken up by the entire photographic press, although neither from that time to this the value of the process has been considered with regard to the permanence of the image. Having in my possession prints dating from 1865, absolutely intact after nearly twenty years, I deem it a duty to publish the fact. The process was known as the shellac process. The paper selected is dipped in a solution of shellac in warm water and an aqueous solution of borax. When dry, it is sensitized in a ten or fifteen per cent. nitrate of silver bath; once more dried, and again plunged in a shellac solution, and left in a dark place. It may be thus kept for a long while. The prints obtained are fixed, first of all, in sulpho-cyanide, and afterwards in hypo. After thorough washing, the operation is finished. To prevent fading from contact with the air, moisture, or deleterious gases, the face of the print is brushed over with a varnish composed of 8 grammes of shellac in 100 c.c. of alcohol. The formulæ used are as follows:—

Borax Solution.

Water	...	...	...	100 parts
Borax	...	...	...	4 ,,
Shellac	...	...	...	8 ,,

Sulphocyanide in an 8 per cent. solution.

Hyposulphite of soda in a 15 per cent. solution.

It is entirely owing to the presence of the shellac that permanence is communicated to silver prints. Most certainly, among our collections of prints dating twenty years back, none can compare in freshness with these shellac prints. I therefore recommend this process as worthy of attention, in which renewed progress may be made as one of the several capable of giving indelible images. A description of Taylor's process is to be found in the Photographic News or 1866, p. 256.

The Laboratory Attached to the Museum of Decorative Arts.—The work of this laboratory commences on April 1st, by reproducing from casts a number of bas-reliefs from the Hotel Carnavalet. It has already been stated that all negatives shall be pellicles, as being easier of transport in case of need. I will inform my readers from time to time of the results obtained. As a similar studio exists at the South Kensington Museum, I should like to be acquainted with the processes followed. The great service rendered by such an addition to the Museum must be considerable.

Printing Process on Copper.—I have just been experimenting on a process which, although not new, is seldom used. It is that of direct impressions on copper for etching or engraving afterwards. The process consists in coating a smooth copper plate with proto-chloride of copper. The plate, well cleaned, is immersed for half-a-minute in a solution thus composed:—

Sulphate of copper	...	...	7·50 grammes
Chloride of sodium	...	...	4·50 ,,
Water	...	...	60 ,,

or, better still, in a bichloride of copper solution. It is next washed, and carefully dried with a soft cloth, then exposed behind a negative and fixed in hypo in which chloride of silver has been dissolved. The length of exposure varies from ten to fifteen minutes. Fixing should take place promptly; the plate must be removed as soon as the deposit of silver on the parts not attacked by light brings out the image in black. A thorough washing next follows. A fatty transparent varnish—wax dissolved in ether or benzole, for instance—must be applied. M. Mialaret published this process in 1865. It is true that the same results may be obtained by equally simple processes, but one cannot have too many strings to one's bow.

Placet versus Goupil and Co.—A curious action is pending at this moment between M. Placet and MM. Goupil and Co. on the subject of the heliotype process practised so successfully by the latter, and which M. Placet claims as his own. The astonishing part of it is, the Placet patents being public property, that he can obtain a hearing for his case, even admitting that the patents have been worked, in itself a very doubtful point. We therefore ask what will it come to if he proclaims himself sole inventor? His success is doubtful, and in any case it is a very delicate affair, as are all those touching on such slippery ground.

Leon Vidal.

STEREOSCOPIC PICTURES ON A QUARTER-PLATE.

BY R. OFFORD.*

In the Photographic News of Dec. 1883, page 780, will be found an abstract of an article on "Stereoscopic Portraits by a Single Camera." Thinking the idea very practical, I provided myself with a music stool, the screw of which failing to act kept the seat in a horizontal plane when revolving. Attached to it was a head-rest, which would move with the sitter. I constructed a carrier for the dark slide thus:—Four pieces of glass of such a size as to leave an opening $6\frac{1}{8}$ by $3\frac{1}{4}$ inches were laid down the outside measurement fitting the dark slide. These glasses were secured together by means of pasting stout brown paper on both sides. On one side a central opening was cut, 2 inches by $3\frac{1}{4}$; on the other side an opening $6\frac{1}{8}$ by $3\frac{1}{4}$; a ledge placed along the bottom of the opening prevented the plate from falling out. It was arranged that the quarter-plate which slides to and fro across the smaller opening and rests on the ledge should not be scratched by the brown paper in passing. Behind the spring, in the back of the dark slide, a hole was made with a needle drill, and also the same through the spring. A piece of black silk passed through both holes and knotted on that side of the spring nearest the plate, and

* A communication to the London and Provincial Photographic Association.

also close up to the outside of back, thus preventing the ingress of light. Putting a plate in position close up to one end of the 3¼ by 6½ sized hole, one-half of it was presented to the action of the lens, the spring keeping it firmly in its place. After making an exposure, and the shutter closed, the slide is raised and tilted whilst the black silk is pulled; the plate being released, the gravity of it sends it sliding to the other end of the hole, and the spring, upon being released again, secures it. Setting an electric shutter before putting back the slide, it is ready for the other exposure, taking only four or five seconds to complete the whole operation. After closing and taking one picture, the stool, with the sitter on it, is turned on one side so as to pass a prominent point (say the nose) through an arc of about half-an-inch, and the second picture is taken. I keep two sights of the stand about a foot apart, and 6 or 8 feet from the sitter, directing them to look at (say) the left for the first exposure, then the right after turning. A long focus lens is infinitely better than a lens of short focus, as a strained effect is produced if the camera is too near the sitter.

Notes.

We commence to-day a series of six lessons on "Carbon Printing."

The late Duke of Albany was a practical chemist, and well versed in photography. Indeed, with the exception of the Duke of Connaught, all the sons of her Majesty have practised photography. The Prince of Wales received his tuition from Mr. Ackland and Mr. Francis Bedford, while the Duke of Edinburgh was an apt pupil of Mr. F. York. Still the Duke of Albany had a special liking for applied science as also for literature, and was altogether of a more studious turn of mind than his royal brethren,

Dr. Carpenter, C.B., F.R.S., was recently lecturing (in connection with the Gilchrist Trust) in the provinces; in the course of the lecture a view of Niagara was projected on the lantern screen. "That," said the doctor, "gives but a poor idea of the Falls, for it is not a photograph, it is a mere painting."

A novel use of photographic negatives came under our notice the other day. A lady desiring the portrait of a relative, whom she knew had been photographed in a town in the south of France, went in search of the studio. She found it after some trouble, but she found also that the photographer had disposed of his business to somebody in another profession, who had utilized the old negatives to glaze a greenhouse! Fortunately the required portrait was discovered among a pile of negatives upon which the hands of the glazier had not been laid.

Now that Miss Mary Anderson's engagement has come to an end in London, it may be permitted to say a word respecting that lady's success as an actress, without appearing either ill-natured or bad-mannered. If ever a young woman could say with truth, "My face is my fortune," that young woman is Miss Anderson; and further, if ever photography did a person a good turn in this world, that person is likewise Miss Anderson. The American actress, who has been making more money in Mr. Irving's theatre than even Mr. Irving made himself, is one of the most charming of models, and her statuesque picture of Galatea—as dainty and as delicate as a rare piece of Dresden china—is simply ravishing to look upon.

No wonder, then, that photography has proved so powerful a means of advertising. "She is very, very pretty," you hear over and over again, as people gaze on the portraits that are everywhere—portraits that, naturally enough, send everybody to see the heaven-born Hebe. And then, the critic, as he sits himself down to enjoy the long-expected treat, suffers a strange and singular sensation. Bit by bit, to his utter dismay, the idol falls to pieces before his eyes; as the statue gradually moves and walks and has its being, he sees a rather common-place young woman, untutored in art, and, what is worst of all, with a voice that knows no pathos, and from whose whole composition you could not distil a single tear-trop. The French sometimes define an actress as one whose voice rains tears; Miss Mary Anderson is the very antithesis of this. But she is very, very pretty in a photograph, where good looks are "more than coronets," and shapely limbs "than Norman blood."

Why on earth do apparatus-makers manufacture instantaneous cameras in the form of gun or pistol? Of all things in the world that renders their owners the objects of suspicion, surely fire-arms are the worst. M. Enjalbert has now an improved photo-revolver, which is said to be of most ingenious construction, as we are quite willing to believe; but who is going to carry such an instrument? Peaceful citizens have a wholesome dread of anything in the shape of a revolver, and although the little camera will do them no harm, it may bring down mischief on the head of the unfortunate photographer. It is all very well to go skylarking about with a mock sort of pistol of this kind, but one fine day a fellow-creature may misinterpret your motive, and it is always difficult to explain matters after you have been knocked down.

The original Bolas detective camera, it will be remembered, was in the form of a boot-black's block, and few objects answer so well to disguise the camera. The notion of employing the opera-glass form is not a bad one, but you naturally look like prying when you hold it up, and thus, if your object is to get a photograph unawares, this is at once detected. A black bag, a brown paper parcel, or some ordinary portable object, is the form a detective camera should assume, and there is little doubt that the first manufacturer who fulfils the conditions satisfactorily will find a ready sale for his apparatus; for pictures of every-day life can only be properly secured when the presence of the photographer is unknown.

Mr. Seavey can do something more than paint pretty backgrounds, it seems. According to the *New York Herald*, a sea coast picture from his brush in the Water Colour Exhibition sold on the first evening for a hundred dollars.

A correspondent says: "If the proprietorship of the negative controversy ever presses a photographer too hotly, let him remember Solomon's judgment, and propose that the negative be halved." This is all very well, but then the presiding Solomon may go on with the *simile*, and hand the negative whole to the other party. Still, if the negative were destroyed, the object of the dispute would cease to exist.

We see that one of the secretaries of the Chemical Society is getting up a dinner for the other secretary, the latter having recently become president of the Society. Dr. Perkin is one of our leading chemists, as he is one of the most successful, for the discovery of Perkin's Purple has been a fortune to him. Still, as the sense of deep gratitude for something or other that he has done for his brother chemists does not strike us very keenly, we hope that "the other secretary" hereafter, when the time comes, will not forget the "one" who is doing him such a good turn.

By the way, the "preliminary list of stewards" idea for dinners, &c., was a very clever one when it was new, but it is too good to last. The honour of appearing in print (whatever it may be worth) is, of course, the only return a steward gets for sharing the extra expenses, and the "preliminary list" notion is for obtaining the greatest amount of honour at the least expense. The names printed in this list are few and select, but still they may be scattered as broadcast as you please; afterwards, when you send out invitations to join the dinner, you send out also a request for more stewards, and the accession of these good people naturally serves to diminish the expenses of those already in print.

Photographers may rejoice. A London fashion paper invites mothers to send in cabinet photographs of infants from the age of six to eighteen months for publication. Eight will be selected by the editor, and engravings of two will be published each week during the month of May, while coupons will be issued that the public may give their opinion as to which is the prettiest babe. The mother of the baby who gains the greatest number of votes will have the privilege of naming some present for her offspring up to the value of two guineas. Naturally there will be a rush to photographic studios all over the kingdom. One thing may be prophesied. The editor will please one mamma, but he will make an enemy of all the rest.

It seems that exhibitors at the International Show, which is to be opened at the Crystal Palace this month, must send in a carte size portrait before a season ticket will be given.

The question of the best light for the dark-room is occupying as much attention in the United States as it is in England. Dr. Garrison's paper, read at a recent meeting of the Chicago Amateur Photographer's Club, details the result of about two hundred experiments made with different kinds of glass. Dr. Garrison sums up in favour of two thicknesses of ruby red (flashed) glass in preference to one thickness of yellow and two of green. The actinic value of these combinations was about the same, but the visual value was enormously in favour of the ruby glass.

The question is one which perhaps concerns the manufacturers of dry plates more than it does the operator. Dr. Garrison is of opinion that up to the present time we have no really safe light for the dark-room, and that the long-continued exposure to which plates in course of manufacture are frequently subjected under the impression that the light is non-actinic, is a delusion to which is probably due most of the failures in dry-plate photography. This is undoubtedly a vital point in the manufacture of dry plates, and makers would do well to pay special attention to it.

Most photographers possess a ready means of dulling glass, whether the same is for a focussing screen or for modifying the light in a studio. Still we may mention two or three methods more or less known. A hot solution of Epsom salts mixed with a solution of gum-arabic, and applied warm, is useful for temporarily frosting windows; another scarcely less efficient plan is to wash over a strong solution of sulphate of soda, warm, and subsequently, when cold, to apply gum-water. The readiest plan of all is to dab the glass with a lump of putty, which, if done carefully and uniformly, imparts a finely-ground appearance. For permanently frosting, a piece of flat marble dipped in glass-cutters' sand and worked wet is to be recommended, powdered emery being used instead of sand at the finish, if a fine surface is desired.

Lotteries are just now very popular. Any photographer in want of a novelty to induce people to join his portrait club might try the effect of offering a prize—say a club of twenty members, each to have a dozen cabinets, and draw lots for an enlargement. Why not?

According to the *New York Sun*, a new use has been found for collodion; it is said to be invaluble in the actor's art of "making up." Gum dissolved in collodion and alcohol is one of the most satisfactory cements for attaching false mustaches and whiskers. The mixture dries immediately it is exposed to the air, is impervious to moisture, and can only be removed by spirits or grease.

Photography is gradually becoming of indispensable assistance to artists, more especially to those engaged on illustrations for periodicals. Only the other day one of the best known draughtsmen of animals expressed his intention of taking lessons, as he found many of his brethren made use of photography to great advantage.

One of the coolest requests made for a long time came under our notice the other day. A photographer who had left a studio, owing some four months' rent, and had opened in the same neighbourhood, called upon the succeeding

tenant of the studio he had quitted, and asked him to be good enough to send on any sitters who called, as he did not wish to lose the connection! Of course the request was at once acceded to.

Neither photographers nor their lady-sitters employ powder very much when posing now-a-days. But since this is sometimes considered a necessary adjunct to the studio—it is casually employed for toning down freckles and red hair—it may be worth noting that brunette face powder is better for photographic lighting than the snowy starch that pink and white complexions usually affect. The brunette powder is simply prepared with the least tinge of some brown pigment, and therefore is better calculated to soften any great contrasts of light and shade upon the face.

Patent Intelligence.

Applications for Provisional Protection.

5,647. JAMES THOMSON, 21, High Park Street, Liverpool, Lancashire, Photographer, for "Improvements in photographic camera-stands for use out-of-doors, on land, or at sea."—Dated 29th March, 1884.

5,686. WILLIAM ROBERT LAKE, of the firm of Haseltine, Lake, and Co., Patent Agents, Southampton Buildings, Middlesex, for "Improvements in frames for stretching paper for photographic purposes."—A communication to him from abroad by L'Abbe Raboisson, Paris, France.—Dated 29th March, 1884.

Notice of Application for Amendment of Specification.

In the matter of Letters Patent granted to RICHARD BROWN, and ROBERT WILLIAM BARNES, and JOSEPH BELL, all of the city of Liverpool, in the county of Lancaster, for an invention of "Improvements in and relating to the preparation of pictures and photographs to be used in the production of pictures by the art of photography and photo-engraving, and in the production of gelatine reliefs and printing surfaces therefrom." Dated 15th March, 1883, No. 1380.

Notice is hereby given, that the said Richard Brown, Robert William Barnes, and Joseph Bell, have applied under sections 18 to 21 of the Patents, &c., Act, and rules 48 to 56 made thereunder, for leave to amend the Specification filed in pursuance of the said Letters Patent, by altering the title to "Improvements in and relating to the production of gelatine reliefs and printing surfaces from pictures and photographs," and by altering the first claiming cause so that it will read, "First, the method substantially as herein set forth for the production of printing surfaces, half-tone pictures, or photographs." By striking out the whole of the 2nd and 3rd claiming causes; by altering the 4th claiming clause so that it will read, "Second, the method substantially herein set forth of giving to metal type a grained or lined surface." By altering the 5th claiming cause so that it will read, "Third, the method of levelling lead printing plates herein described." And by altering the corresponding descriptive parts of the Specification in accordance therewith.

Any person intending to oppose such application must leave particulars in writing of their objections to such proposed amendment at the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C., within one calendar month from this date."—Dated this 1st day of April, 1884.—H. Reader Lack, Comptroller-General.

ILLUMINATION OF THE DARK-ROOM, AND SOME OPTICAL EXPERIMENTS.

BY CAPTAIN ABNEY, R.E. F.R.S.*

IN turning over some old specifications of patents I came across one by Claudet, in 1844, in part of which he says:—"The fifth and last improvement consists in performing all the operations (of taking a Daguerreotype) upon the plates, which were formerly carried out in the dark, now in a room lighted through media of various colours; but red I prefer, which having very little effect upon the plates covered with the sensitive coating, allows the operator to see how to perform the work, without being obliged, as before, to remain in a dark-room." I suppose, then, we may conclude Claudet was the first to use any light whatever in the early days of photography. Forty years later we still had the subject of illuminating the dark-room occupying our attention, though I had thought that the question as to which light was the best and safest had been pretty well settled. The subject of the canary medium has, however, revived, and, like others, I have examined its qualities.

At the January Monthly Technical Meeting of the Society I brought some samples of what I supposed to be canary medium, and showed the results I had obtained with it. The canary medium that I had manufactured was made by emulsifying chromate of lead in gelatine by means of the double decomposition of acetate of lead and bichromate of potash, and applying it to glass and paper. I also soaked paper in acetate of lead and then in bichromate of potash, and got a very good imitation of the canary medium. The results were not satisfactory. With three gelatinized glasses in front of the negative, in three and a-half minutes I was able to obtain a fully exposed transparency, whilst with the paper in a lantern, two thicknesses of same paper, impregnated with the lead chromate, enabled me to get a transparency in three minutes, the source of light in the lantern being a candle, and the negative placed a foot from it. The illumination was brilliant—much more so than when I used the common orange packing paper, which I show. With the orange paper, after five minutes' exposure, I got the very faintest trace of an image.

So far, then, my test went to prove the superiority of the orange paper. After I had made my remarks at our Monthly Technical Meeting, Messrs. Scorah and Co., of Bradford, kindly sent me a sample of the true canary medium, and with this I have experimented. The paper you will notice is thick—I may say very thick—much thicker, indeed, than the orange paper. Now, about the illuminating value of the two. I show a lantern in which we have one side formed of a square of canary medium, another of a square of orange paper, and the third side a square of stained red glass, of which I shall have to speak by-and-bye.

I think that the members of the Society will agree with me in saying that of the two paper panes, the orange is the more brilliant. Now, appearances may be deceptive, of course; so, to avoid all cavil, I made photometric tests of the two. The candle being lighted, a piece of printed matter was held in a vertical plane. The eye was kept at a fixed distance from the paper, and the lantern moved till the letters of the words could not be distinguished. In the case of the canary medium, I found that at 2 feet 0½ inch the letters first became confused, whilst at 2 feet 6½ inches they became confused when the orange light was tested.

Though not absolutely exact, the relative intensities of illumination may be taken as the squares of the distances, which would make them about as 16 to 25, or the orange paper had 1½ times as much illuminating power as the canary medium. Testing the stained red glass, I found that the light had to be moved to 4 feet 4 inches distance, or was 4½ times more luminous than the canary medium. Thus, the illuminating values of the three were about as follows:—

Canary.	Orange paper.	Stained red.
1	1½	4½

To further test this matter, closely ruled black lines, on a white ground, about $\frac{1}{30}$ inch apart, were taken and placed at 6 feet distance from a small observing telescope, and the lights moved as before. In the case of the canary medium the lamp had to be moved 3 feet 2 inches from the ruling, the orange 4 feet 1 inch, and the stained red 6 feet 7 inches. These were all the mean and three closely accordant readings. This gave the relative illuminations as—

Canary.	Orange paper.	Stained red glass.
1.	1·63	4·32

The reading test, and the more accurate test, here adopted, are closely accordant in every way. In fact, this is very much the plan that is adopted for star magnitudes, though in this case the surface of the object glass is diminished by diaphragms, instead of the stars themselves being deprived of luminosity.

So much for my own readings. It seemed that it would be curious to note any differences in individual eyesight as to the

* Read before the Photographic Society of Great Britain.

intensity of colour in these media, and yesterday I had the good fortune to secure Mr. C. Ray Woods as an observer, and later Mr. Cadett. In this case the experiment had to be slightly varied, from my dark room being only partially available, and the light and the eye were kept in a constant position, whilst the ruled lines above mentioned were moved to and from the observer. The following table gives the result of the comparison of Mr. Wood's eyesight for colour with that of my own :—

	Mr. Woods.			Captain Abney.		
	First Exp.	Second Exp.	Mean.	First Exp.	Second Exp.	Mean.
Canary paper... ...	1·00	1·00	1·00	1·00	1·00	1·00
Orange paper... ...	1·87	1·86	1·86	1·51	1·44	1·47
Stained red glass ...	5·14	4·76	4·90	3·00	3 12	3 06

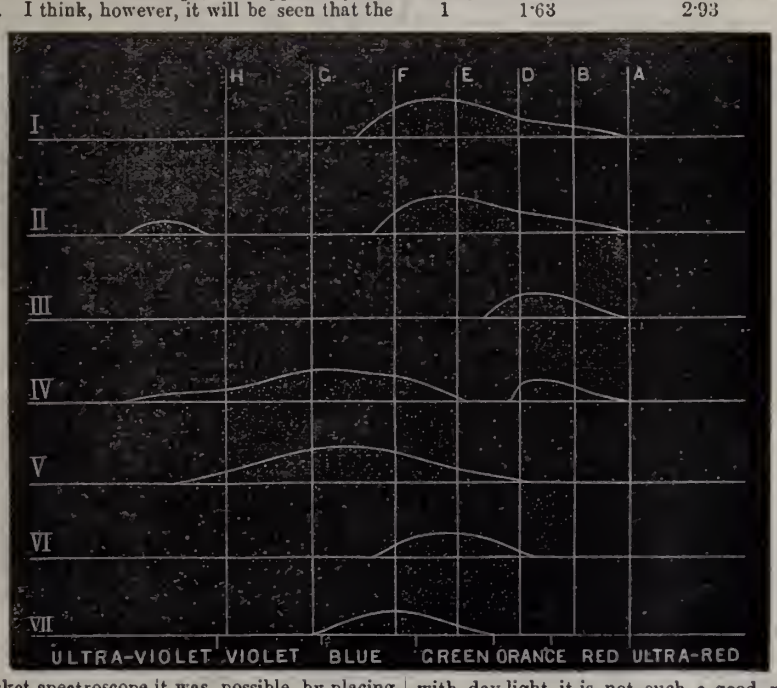
To sum up, Mr. Woods made the illuminating powers 1, 1·86, and 4·90; whilst I made mine 1, 1·47, and 3·06. It will thus be seen that as the green was cut off, so Mr. Woods' vision became more acute than mine.

Mr. Cadett's figures were again different to mine; and here I must interpolate that a more exact observer I have not met with. His observations did not vary more than $\frac{1}{4}$ of an inch on each side of the mean. His reduced readings were 1, 1·39, and 2·70. We therefore see that his eyes are less susceptible to red rays than mine, and still less so than Mr. Woods'. This last method of testing is inexact, of course, and cannot be compared for accuracy with that of the fixed lines and telescope, and apparently the results do not accord. I think, however, it will be seen that the want of accordance is more apparent than real. Taking my own observations of printed matter, for instance, when the printed matter was moved the distances, in the last experiments, from the eye (not from the light) were 21 inches, 24 inches, and 30 inches.

The angle subtended by the writing at the three distances would be inversely as the distance, and the confusion of lines would be sooner arrived at than if they always subtended the same angle, as was the case in the first experiment. To make the two readings comparable one with the other, the orange paper and stained glass readings, the last experiments must be multiplied by $\frac{24}{21}$ and $\frac{30}{21}$ respectively. This would give the reduced readings as 1, 1·63, and 4·37, which is very nearly the same as 1, 1·69, and 4·32, which were the figures of the telescope reading. However, one thing has been apparently proved, that the eyes of three persons chosen at random are not equally sensitive to the red rays. Mr. Woods informs me that he can scarcely see H and K in the extreme violet limit of the spectrum; whilst I can see not only H and K, but L, and, in bright light, M as well. It seems then as if there were in his case a general lowering of sensibility and wave length. I have not taken into account colour-blind people. This I may deal with at some subsequent period.

I may remark that with a sheet of white tissue paper in front of the glass the figures came out as—

Canary.	Orange.	Stained red, with tissue.	Stained red, bare
1	1·63	2·93	4·37



By means of the pocket spectroscope it was possible, by placing two pieces of paper alongside one another in the lantern, to examine their absorption spectra comparatively. The result showed that the red and yellow of the canary medium were decidedly fainter than in the orange paper, whilst in the former appeared more green and a little blue. *Primâ facie*, then, the orange should be the best medium to use for photographic purposes.

So far we have had merely a theoretical test for the chemical value—the question is, what is the practical one? A plate was exposed behind a negative with a piece of orange paper across one half, and a piece of canary medium across the other, with the result that after 1½ minutes' exposure to candle power 2 feet off, there were traces of an image through both, the two being nearly alike. Perhaps the orange paper had a little the best of it. Behind the stained red glass not a trace of an image appeared with the same exposure. Thus, then, the practical test leads to this conclusion, viz., that of the three media, stained red glass is the best, both as for illumination and want of effect on a plate, whilst the canary and orange papers acted alike as to their effect on the plate; but the illumination was 50 per cent. in favour of the latter. I must confess that the canary madium behaved much better than I expected in candle light. I may add that with day-light it is not such a good protection as the orange paper. Stained red glass behaves better than either of these two; and when I say stained red, I do not mean orange or flashed silver glass, which is often spoken of as stained red.

I have to lay before the meeting a photograph of the absorption spectra of different glasses, taken by the electric light; the first plate shows—

1. Chromate of lead.
2. Orange glass.
3. Stained red.
4. Flashed ruby.
5. Green glass.
6. Green glass and chromate.
7. Green glass and ruby.

Another plate I show is the same as the 1st, with the exception that it was taken with a candle as the source of illumination and that in No. 4 a very deep ruby flashed on two sides was used, and for 7, cobalt glass and ruby superposed were spectroscoped.

The orange glass lets through the ultra-violet with the electric light, but does not do so with the candle, as there are few ultra-violet rays in its light. The ruby glass lets through the green and blue in both cases. In the 2nd plate the impression

made by these colours is only faint, but still it is there; and when it is recollected that the two minutes' exposure was given to a slice of light $\frac{1}{200}$ inch broad, spread out into a spectrum four inches long, and that an impression was made by it on a sensitive plate, it will readily be seen that two minutes' exposure to undispersed light would make a far greater impression.

The use of green glass is not to be recommended, since it only cuts off red rays, which are comparatively harmless, and materially diminishes the light. In regard to canary medium, it is, I should say, paper impregnated with chromate of lead. It must be recollected, however, that chrome yellows are of different tints. Thus, ordinary chromate of lead can be altered in tint by the addition of nitric acid, and much deepened in colour. It may be, perhaps, advantageous to use such a deepened colour; but as to this I speak with some hesitation, since my experiments in this direction have been very meagre. Let me, in conclusion, say that I have no bias one way or another, and that I should not hesitate to use canary medium of such a quality as has been sent me in the development of plates. At the same time, I should not care to expose very sensitive plates long to the light coming through it, since I should expect disaster. The point is to use the safest light possible—for no light is absolutely safe—and to use the greatest quantity of it within the margin of safety. This was a point laid down by one of the speakers at the January Technical Meeting, and cannot be too much insisted upon.

A Dictionary of Photography.

ALBUMENIZING GLASS PLATES.—*See* **Collodion Process.**

ALCOHOL.—A term originally applied to the essential volatile constituent of wines and other fermented liquors, but now applied by chemists to a large group of carbon compounds which are analogous to ordiuary alcohols in their constitution. The only alcohols of photographic interest are the ordinary ethylic alcohol or anhydrous spirits of wine, C_2H_5HO, and methylic alcohol or wood spirit, CH_3HO. This latter, indeed, only possesses an indirect interest, it being used in making the mixture sold as methylated spirit.

Ordinary alcohol or ethylic alcohol is a colourless and very mobile liquid, lighter than water; its burning astringent taste, agreeable odour, and intoxicating action, being well known. Its specific gravity when pure is 0·7938 at 48·2° C., or 60° F., and its boiling point 78·3° C., or 173° F. Its chemical composition is expressed by the formula C_2H_6O, or C_2H_5HO. It is prepared by distilling liquids which have undergone vinous fermentation, such as wine or beer. The distillation is repeated once or twice, rejecting the parts which last came over, and the alcohol, being more volatile than the water, passes over first. Alcohol is frequently contaminated with *fusel-oil*, a mixture consisting mainly of amyl-alcohol, which imparts to it a peculiar, disagreeable odour. It is difficult to separate this substance from it on the small scale, and therefore care should be taken in purchasing a quantity of alcohol that no impurity of this kind exists in it. The presence of fusel-oil in alcohol may be recognized by the taste, especially after dilution with a large quantity of water, and by the unpleasant odour, especially after rubbing it between the hands, or letting it partially burn away. Alcohol, free from fusel-oil, should remain clear when mixed with nitrate of silver, and exposed to sunshine; but spirits of wine containing fusel-oil assume a faint red tint. Alcohol, in its strongest form, or *absolute alcohol*, cannot, however, be obtained by mere fractional distillation; for, although alcohol boils at 78·3° C., its vapour nevertheless takes up a quantity of aqueous vapour, hence the most highly rectified spirit obtained by repeated distillation still exhibits a density of 0·820 to 0·830. The complete dehydration of alcohol is usually effected by distilling the most highly rectified spirit over fixed substances which have a strong tendency to retain water; *quick-lime* being most usually employed. About equal weights of good quick-lime and strong spirit are left in contact with each other in a closed vessel for a few days; on being distilled in a water bath until about half the alcohol has come over, and this distillate being again treated with lime, and distilled as before, absolute alcohol is produced. *See* Distillation. In very careful experiments, however, it will be advisable to rectify the alcohol so obtained over dry charcoal powder and a little crystallized tartaric acid, in order to remove a slight smell which it has acquired, and also a little lime which may have been carried over. Alcohol may be regarded as perfectly anhydrous if sulphate of copper previously burnt white and immersed in the alcohol does not recover its blue colour after remaining in contact with it in a closed vessel for a few hours.

Of elementary substances alcohol dissolves only a few, such as sulphur, phosphorus, iodine, &c., all of the non-metallic class. Of *inorganic* substances it may be stated, as a rule, that all compounds soluble in alcohol are also soluble in water; but some compounds are soluble in water which are not soluble in alcohol; and substances which are soluble in both liquids dissolve more abundantly in water than in alcohol. There are, however, certain exceptions; thus, corrosive sublimate dissolves more abundantly in alcohol, especially in absolute alcohol, than in water. It may also be laid down as a general rule, that *efflorescent* compounds are insoluble in alcohol; and deliquescent substances, excepting carbonate of potassa and a few others, are soluble in alcohol. Many substances, when dissolved in alcohol, impart to it the property of burning with a peculiar coloured flame—*e.g.*, boracic acid, and the salts of lithia, baryta, strontia, lime, copper, &c.

Alcohol mixes in all proportions with ether. If the latter be in excess, a portion is separated on adding water; but if the alcohol is in excess, a homogeneous mixture is formed.

Subjoined is a table showing the specific gravity of mixtures containing various percentages of alcohol and water at a temperature of 48·2° C.

Alcohol per cent.	Specific Gravity.	Alcohol per cent.	Specific Gravity.	Alcohol per cent.	Specific Gravity.	Alcohol per cent.	Specific Gravity.
0·5	1·0000	25	·9652	51	·9160	76	·8581
0	·9991	26	·9638	52	·9135	77	·8557
1	·9981	27	·9623	53	·9113	78	·8533
2	·9965	28	·9609	54	·9090	79	·8508
3	·9947	29	·9593	55	·9069	80	·8483
4	·9930	30	·9578	56	·9047	81	·8459
5	·9914	31	·9560	57	·9025	82	·8434
6	·9898	32	·9544	58	·9001	83	·8408
7	·9884	33	·9528	59	·8979	84	·8382
8	·9869	34	·9511	60	·8956	85	·8357
9	·9855	35	·9490	61	·8932	86	·8331
10	·9841	36	·9470	62	·8908	87	·8305
11	·9828	37	·9452	63	·8886	88	·8279
12	·9815	38	·9434	64	·8863	89	·8254
13	·9802	39	·9416	65	·8840	90	·8228
14	·9789	40	·9396	66	·8816	91	·8199
15	·9778	41	·9376	67	·8793	92	·8172
16	·9766	42	·9356	68	·8769	93	·8145
17	·9753	43	·9335	69	·8745	94	·8118
18	·9741	44	·9314	70	·8721	95	·8089
19	·9728	45	·9292	71	·8696	96	·8061
20	·9716	46	·9270	72	·8672	97	·8031
21	·9704	47	·9249	73	·8649	98	·8001
22	·9691	48	·9228	74	·8625	99	·7961
23	·9678	49	·9206	75	·8603	100	·7938
24	·9665	50	·9184				

In this table every alternate number is the result of a direct synthetical experiment; absolute alcohol and distilled water being weighed out in the proper proportions.

Of the photographic uses of alcohol it is needless to say much, it being in most cases employed as a mere solvent. The circumstance of strong alcohol having a considerable affinity for water is of importance, as alcohol thus affords a convenient means of removing a large proportion of water from gelatinous materials in many cases. Thus, for example, if a weak jelly, a wet gelatino-bromide plate, or a piece of freshly-sensitized carbon tissue is immersed in alcohol, the water becomes more or less perfectly extracted.

Methylated alcohol is a mixture of ordinary alcohol with ten per cent. of wood spirit, and as such a mixture is sold without being subject to excise duty, a considerable economy is effected by making use of it for photographic purposes, and in the majority of cases it answers as well as the pure spirit. The so-called "methylated finish" is methylated spirit in which a small proportion of resinous gum has been dissolved, and this addition unfits it for most photographic uses. Although neither "methylated spirit" nor "methylated finish" are subject to Custom Duty, the former is only sold by persons having a licence from the Inland Revenue Department.

Methylic alcohol (CH_3HO) is a volatile liquid having properties similar to those of ordinary alcohol. It is formed during the

destructive distillation of wood, and in some of the chemical reactions. In a crude form it is sold as wood-spirit or wood-naphtha.

PHOTO-LITHOGRAPHY AND PHOTO-ZINCOGRAPHY.

BY MAJOR J. WATERHOUSE, B.S.C.,

Assistant Surveyor-General of India.

Chapter XVI.—Negative Transfer Processes.

Professor Husnik, in his *Gesammtgebiet des Lichtdrucker*, gives the following method with dextrin and albumen.

Dissolve 2 parts of dextrin in 30 parts of water, and add the solution to the whites of four eggs beaten up to froth; filter the mixture through muslin. Then take smooth Rive or Saxe paper, and float the best side on the solution. Unsalted albumenized paper may also be used, but does not leave the stone so readily as when dextrin is used. The paper is allowed to dry.

Another similar bath is now made, but to it 6 parts of spirits of wine and 1 part of bichromate of ammonia are added. Liquor ammonia is dropped in till the mixture begins to smell of it. This solution can be kept in good order for more than a fortnight without losing its sensibility. The already coated paper, or ordinary albumenized paper, is now floated on this second bath, taking care to avoid air-bubbles.

The paper will not keep in good order for more than two or three days in summer, or four or five in winter.

The exposure under a line negative should be two to four minutes in the sun, or ten to fifteen in diffused light, until all details of the image appear.

The print is then floated on water, face upwards, until the lights show a damp shiny appearance, and the coating begins to be tacky without being too soft. The paper is then laid on a large sheet of paper, and put through the press with strong pressure, so that it gradually attaches itself to the stone without folds or creases being formed.

The paper is then washed with warm water and removed. The resulting dextrin image is dried, blackened all over with transfer ink, and developed with water. The stone is then etched, rolled in, and printed in the usual manner.

Captain Hannot has lately described another method of this kind, in which the bichromate and soluble colloid, having been removed from the print after exposure to light, gum is forced through the paper from the back, and is prevented from touching the stone in the lines by the insoluble colloid (see News, vol. xxii., p. 358).

A sheet of ordinary albumenized paper is sensitized by being floated face upwards on a concentrated solution of bichromate of potash, and dried. After exposure under a negative as usual, the print is floated face upwards on water to which a little solution of ammonia has been added, and is allowed to remain thus, and protected from the light. The water gradually penetrates the paper, and dissolves the unaltered albumen and bichromate. The water and ammonia bath is renewed once or twice till all the bichromate has disappeared. The print can then be immersed in the water to finally remove all soluble matter, and is hung up to dry.

The transferring of the image is conducted as follows:—

The print is laid face downwards on a clean lithographic stone or zinc plate, either polished or finely-grained, according to the value of the picture. Over it is stretched a sheet of dry gummed paper prepared by immersion in a 5 per cent. solution of gum-arabic, and over this one or two sheets of damped paper. The stone or zinc plate must have been previously arranged in a percussion press, and, thus charged, is submitted to strong pressure for about fifteen to twenty minutes. By this means the moisture of the backing paper dissolves the gummy coating, which penetrates through the back of the print on to the stone or zinc, except in the parts corresponding to the lines of the image, which are protected by the coating of insoluble and impermeable chromated albumen. When the paper is removed, a clear negative image should be visible. The after treatment is as in the other processes before described.

The damp sheets of paper should be prepared about half-an-hour beforehand, by damping some sheets of dry paper with a sponge, and inserting others between them, when they will soon be found to be equally and evenly moistened.

The writer has little or no practical experience of these processes, which are better suited for work of moderate size, or within the limits of a single negative, than for large maps or drawings, which require to be photographed in sections; but they would seem to have several advantages:—

1. In simplicity of manipulation, the inking and washing with either hot or cold water being dispensed with.

2. In accuracy of scale, the transfer print being laid down on the stone dry, and just as it comes from the printing frame, and pressed into contact with the stone by vertical pressure, is not exposed to any alteration of scale or stretching, as is the case with transfers that have been washed and transferred by scraping or rolling pressure.

3. Greater delicacy and perfection of results, because the image is undisturbed during the operation of transfer, and the finest lines are preserved intact; whereas in the washing-off and inking-up methods they are more or less liable to damage. Any slight squeezing out of the gummy coating will tend to make the lines finer, while in greasy ink transfers the tendency is for the lines to be made coarser by the squeezing out of the ink under the action of the press.

4. In cases where the soluble coating is removed before transfer, as in Captain Hannot's new method, the transfer prints may be kept indefinitely before transfer.

On the other hand, however, there are several disadvantages and difficulties to overcome before these methods can be worked with certainty and success.

The principal difficulty is to obtain just the exact amount of moisture to communicate sufficient of the gummy ink-resisting coating to the stone, without at the same time softening it too much, and thereby causing the finer lines to be blocked out.

In using rolling or scraping pressure for transferring, some care is required in avoiding folds in the paper, and there is still more tendency for the soluble coating to spread over the lines if the proper amount of moisture be exceeded.

The paper is also sometimes difficult to remove from the stone, especially as care must be taken that no moisture gets between the paper and stone, otherwise the gummy coating will dissolve and cause white spots.

The specimens shown by Toovey and others prove conclusively that the method will give excellent results, and were therefore well worth attention.

Correspondence.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

Sir,—Your correspondent, "Councillor," of last week, seems to think that sufficient space is not devoted to the reports of the so-called "Technical Meetings" of the Photographic Society; and he also complains that you do not give sufficient prominence to the title. Since "Technical Meetings" were first instituted by the South London Society in 1872, I have been a regular visitor, and have profited much by an inspection of the novelties shown. Hoping that the new meetings of the Photographic Society of Great Britain would have some interesting features in common with the original Technical Meetings beyond the mere similarity in title, I attended the meeting at Pall Mall on the 26th of February last. When I entered, a gentleman was laboriously describing the well-known method of tracing slides for the lantern on ground glass, by laying the same on the original drawing, and pencilling

over after the fashion of the child's "transparent slate," the glass being finally varnished to render it more transparent. But the climax was reached when the same gentleman commenced passing through the lantern an interminable series of tracings which he had made from engravings of insects, &c., by drawing with the aid of the transparent slate. After remaining for about half-an-hour, I left, and in returning home I had abundant opportunity of meditating on the deceitfulness of names; and I concluded that to have learned that a member could draw tolerably well with the aid of the "transparent slate," was a poor recompense for an evening spent.

Has not the Photographic Society a Journal of its own? Cannot the members enjoy full reports in this? I was pleased to see that you did not mention the "Transparent Slate" exhibition in your report.—Yours truly,

W. L. LOWDE.

SIR,—In reference to the letter of "Councillor," which appears in your last issue, allow me to remark that I have been present at two of the new technical meetings of the Photographic Society of Great Britain, but was not very much interested, as on each occasion the only technical appliances exhibited were articles which had already been brought under discussion at the London and Provincial Photographic Society. If "Councillor" wishes to see long reports of the new technical meetings, he should get his friends to bring novelties for exhibition and discussion.

I think there is a danger of the new technical meetings being confounded with the annual technical meetings of the South London Society. These latter have, since 1872, been a notable feature in the photographic calendar.—Yours, &c., EAST END.

IVES' PROCESS.

SIR,—Your readers should understand that my original invention is not merely a particular manner of producing an inked impression of lines and stipple by pressure with a Woodburytype relief, but that it covers the principle of using the relief, ink, and lined or stippled surface, with pressure for that purpose. I distinctly specified that I did not confine myself to any particular material or apparatus for that purpose, and I only described in detail one method, because that is all that our United States Patent Law requires. My patent here would be regarded as the "mother patent," to which all such as Eggis' and Zuccato's would be subject, since they are not new processes, but mere modifications of the original "Ives' process."

I will add that there has not yet been a single modification of the original process published which I had not already tried and condemned as impracticable for commercial purposes, and not one which is worthy of comparison with my process as I now operate it. This I shall be able to demoustrate to you.—Yours truly, FRED. E. IVES.

Philadelphia.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 27th inst., Mr. W. M. ASHMAN in the chair.

Mr. A COWAN, in exhibiting a machine for wiping emulsion from the backs of plates, said a coating machine was very useful, but a little emulsion always found its way on the back. To keep the backs clean, he used to wipe each on a pad; this was clumsy. The pads were then placed against the wall on a couple of brackets. As the pads soon clogged, they often required shifting. Finally, he made the more complete arrangement shown, by which a shift of three-eighths of an inch in the rollers presents a fresh surface to each plate. Three yards of flannel were sufficient for one hundred and eighty plates.

A full description of this machine will be found on page 207 of the present volume.

Mr. A. L. HENDERSON enquired if the flannel could be used a second time without washing.

Mr. COWAN replied that it could.

Mr. HENDERSON demonstrated the method of making emulsion mentioned in the last report of this Society (page 206). He said: The formulæ given to-night I won't say is the best or the most perfect which can be obtained by this method, but it is capable of giving very good results, which anyone may verify, if they please. The new departure consists in forming bromide of silver in acetate of ammonia in the following manner. One hundred and forty-seven grains of carbonate of ammonia in six ounces of distilled water are neutralized with Beaufoy's acetate acid (requiring five drachms and a half); one hundred and seventy grains of nitrate of silver, in another six ounces of water, are stirred in, which, in forming acetate of silver, effervesce, giving a frothy solution, which may be, so far, treated in daylight.

Mr. A. MACKIE: Does more or less acetic acid make any difference?

Mr HENDERSON preferred using it nearly neutral. Continuing, he said one hundred and twenty grains of bromide of potassium in another six ounces of water are then slowly stirred in, when the bromide will be found to go down very rapidly. No doubt exceeding fineness could be obtained by the addition of a small quantity of gelatine to the mixture before adding the bromide. After washing the precipitate twice, the gelatine was added, the whole being warmed up. Plates were coated and passed round.

Mr. COWAN enquired if there was a possibility of making such an emulsion more rapid?

Mr. HENDERSON: Yes, by the addition of ammonia, about five or six minims to each ounce of emulsion.

Mr. W. E. DEBENHAM asked what heat the emulsion would bear after ammonia is added? He did not consider it safe to raise the temperature of an ammonia emulsion to 150° F., or fog would result.

Mr. HENDERSON only raised the temperature sufficient to melt the gelatine, about 120° F. He had a batch some time ago giving round holes, or pits; previous to coating, he added six drops per ounce of ammonia, which overcame the difficulty. Finer plates he never had.

Mr. W. B. B. WELLINGTON: How much emulsion will 170 grains of silver make?

Mr. HENDERSON: I used 170 grains, and there is rather more than eight ounces here.

Mr. DEBENHAM said the principle was very like that published by Captain Abney—viz., carbonate of silver. This he tried, but could not get rapidity.

Messrs. HENDERSON and MACKIE failed to get good results by that method, or by the chromate of silver method.

Mr. DEBENHAM exhibited a portable lantern in which cherry fabric had been substituted by yellow paper and oil silk of a pale green colour. A rapid plate was developed six inches from the lamp without trace of fog.

In reply to a question, "What is an Emulsion?"

Mr. DEBENHAM replied that there had been considerable differences of opinion on the point, and he could only give his view without pretending to consider the question as settled. He considered that emulsion consisted of a mixture of two substances—one of which must be a liquid—not chemically combined, but so intimately mixed that they would remain for a considerable time without separation.

Mr. MACKIE believed it was a mixture in which two substances would only mix on the application of a third.

Mr. W. COLE said originally the application extented to oily substances mixed with gum, afterwards to resinous substances held in solution by gum; in that sense it applies to gelatine emulsion. If a precipitate is made so fine that it takes a long time to settle, it makes it equivalent to holding a resinous powder in suspension by gum.

Mr. MACKIE passed round some instantaneous street views (Paris), stereoscopic size, made fully twenty years ago.

A communication was then read from Mr. R. Offord, on "Making Stereoscopic Pictures upon a Quarter-Plate" (see p. 215), examples being shown illustrating the relief obtainable.

A discussion then ensued on washing out glycerine and colloid bodies from bromide of silver emulsions.

The SECRETARY passed round some pamphlets relating to paper enlargements, sent by Messrs. Goodall and Stephen.

It was also announced that the next lecturette will be given on April 10th, by Mr. W. E. Debenham, "On Lenses." The following lecturette will be on May 8th, "Science of Polarised Light," by Mr. C. Darker.

Glasgow Photographic Association.

The eleventh general meeting of this Society was held in the Religious Institution Rooms, on the 20th ult., Mr. Robert Dodd, Vice-president, in the chair.

After the minutes of the previous meeting had been read and disposed of,

Mr. William Lang, Jun., read an interesting paper on "The Photographic Qualities of Biehromate Salts, and Mr. Woodbury's Stannotype Process." He also demoustrated the workiug of the process, which seemed both simple and satisfactory. A number of specimens, lent by Mr. Woodbnry for the occasion, showing first-class work at all the different stages, were very much appreciated by the meeting.

Mr. Robertson then gave a general description of the original Woodburytype process, and exhibited a number of lead printing blocks, and also impressions from them, which had been sent to the Association by Mr. Woodbury at the time the process was patented.

Votes of thanks were then awarded to Mr. Woodbury and Mr. Lang, and the hope was expressed that further practical demonstrations would be given at future meetings.

Photographic Society of Ireland.

The annual optical lantern exhibition was held on Friday, 28th inst., in the Royal College of Science, Stephen's Green, E. As on former occasions, the transparencies were taken from the negatives, the work of the members during the past year, nearly all being produced on collodion films, the majority of the pictures evidencing a marked improvement on former work. The following gained well-merited approbation:—"Interior of Ruins of Glastonbury Cathedral," by Mr. C. Fallen; "Interior of Bruges Cathedral," and "Interior of St. Paul's, Antwerp," by Mr. H. Bewley;" "A Snow Scene," by Mr. Conan. This was an exceedingly pretty picture, the snow being rendered very effectively. Mr. Pim's "Studies of Trees" were very interesting and beautiful, he having made a speciality of this branch of photography during the past summer. The yawl *White Rose*, by Mr. E. P. Johnson, was a real gem. It was taken from a punt, in Killiney Bay, Dublin, Mr. Johnson holding the camera in his hand while he made the exposure. A selection of views taken by Mr. J. L. Robinson, in Normandy, Lisieux, and Bayeux, were much admired.

The evening was most enjoyable, and, to judge from the attendance—nearly 400 ladies and gentlemen being being present—the interest taken in the exhibition was most encouraging.

The following also sent in contribntions:—Messrs. Curtis, Baker, Webb, Robertson, Bewley, Mitchell, Scott, Roper, Watson, and others.

The next ordinary meeting is intended to be held May 9th.

Liverpool Amateur Photographic Association.

The monthly meeting was held in the Free Library, on the 27th ult., Dr. Kenyon in the chair.

The minutes of the February meeting having been read and passed, Messrs. Archer, Durnford, McMurtrie, New, and Williams were elected members of the Association.

Mr. J. H. Day announced that he had received the following donations to the library:—A volnme of the Photographic News from the Rev. H. J. Palmer, the records of the Photographic Society of Philadelphia, and eighteen lantern slides from the Honorary Secretary. Mr. Day expressed a hope that many members of the Association would now follow the good example which had been set them, and present nnmerous transparencies for the lantern to the small collection at present connected with the library.

The Hon. Secretary read a letter from an American amateur, enclosing some views of American scenery, and asking for English photographs in exchange.

Mr. B. Boothroyd gave some details with regard to Rufford Hall and its surroundings, and kindly consented to undertake the management of the excursion thither on the 26th instant.

Mr. G. A. Thompson then read his paper entitled "Photographic Notes of a Voyage from Liverpool to Trieste in a Cunard Steamer, January, 1884," and exhibited a large number of interesting and beautiful pictures taken by him on his recent tour. He said, moreover, that he had used Mr. Kirkby's shutter, and also one recommended to him by Mr. Forrest. Both had given good results; but he had met with some difficulty in obtaining sharp pictures, owing to the vibration of the stand. He (Mr. Thompson) exhibited the whole of the apparatus used by him on his journies.

The Chairman, referring to the fact that some of the seascapes were over-exposed, said that lenses should be stopped down when rapid plates were exposed at sea.

Mr. Day spoke approvingly of the views of shipping, &c., taken years ago by the Rev. H. J. Palmer with a simple cardboard shutter; but he thought, on the whole, that the shutter devised by Mr. E. Roberts was the best for this class of subject.

Mr. R. Crowe remarked that over-exposed seascapes could always be saved by care and management in the development.

Mr. J. H. T. Ellerbeck spoke very highly of Edwards' shutter, and thought the results exhibited by Mr. Edwards were among the finest instantaneous pictures produced.

The Hon. Secretary reminded members of the neglected condition of the Society's album, no prints having been contributed to it for some time.

The Rev. H. J. Palmer gave an account of some further lantern experiments, which he had been making with the pamphengos and the pentaphane, since the last meeting. Mr. Watts had had one of Archer's reflectors substituted for the ordinary pamphengos reflector, but Mr. Palmer had failed to detect the slightest increase of brilliancy.

Mr. Blanchard passed round an album of views, among which were some extremely interesting pictnres taken at Lagos, and other places on the coast of Africa.

Mr. A. Beer exhibited some very fine enlargements from 10 by 8 negatives belonging to him, made by Mr. J. Harmer, of Littlehampton.

Mr. Thompson showed his camera, lenses, and shutters, a large number of views in the Mediterranean, Sicily, Naples, Trieste, and Venice, and also a portable Buckle stand with some improvements by Mr. Crowe.

The meeting was then adjourned to the last Thursday in April.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday, April 8th, at eight o'clock, at the Gallery, 5A, Pall Mall East, when the evening will be devoted to an examination into the mode of preparation of lantern slides, and their exhibition with the Society's optical lantern (oxy-hydrogen lime light). Amongst others (illustrating the various processes, old and new), transparencies will be shown by Dr. Huggins, F.R.S. ("Astronomical"); W. F. Donkin, F.C.S., F.I.C. ("Alpine"); and by R. Meldola, F.R.A.S. ("Scenes and Natives of the Nicobar Islands.")

Presentation to Mr. P. C. Roche, of New York.—A very enjoyable gathering of the photographic fraternity was assembled on the 18th ult. at Martinelli's famous restaurant on the Avenue, New York, for the purpose of presenting that old veteran of the art, Mr. Thomas C. Roche, with a slight token of their esteem and respect. At eight o'clock quite a goodly company (upwards of sixty) sat down to an enjoyable French dinner under the chairmanship of Col. V. M. Wilcox. Mr. Bogardus made the presentation speech, and handed Mr. Roche a handsome gold watch and chain. His remarks were very felicitous, and were followed by some lively and interesting toasts and speeches. The inner case of the watch was engraved as follows:—"Presented to T. C. Roche, from brother photographers, as a mark of esteem, and in recognition of his valued services to the craft, March 18th, 1884." Nearly all the leading photographers of New York were present, and also many amateurs.

Separation of Rays of High and Low Refrangibility.—By F. V. Assche, *Compt. Rend.*, 97, 838—840).—A thin layer of selenium, obtained by compressing a drop of the fnsed substance between plates of glass at 250°, and allowing it to cool slowly under pressure, only transmits the rays between Fraunhofer's lines A—C. The amount of absorption increases with the thickness of the layer. When a beam of white light is passed through a solution of alum, and then through a film of selenium, all the luminous rays are arrested. A thin film of selenium, if heated to 250°, is apparently opaque to all luminous radiation.—*Journal of Chemical Society.*

Yet Another Application of Photography.—Drawing corks is too tedious an operation. They are now photographed by the instantaneous process.—*Funny Folks.*

Photographic Club.—At the next meetiug on April 9th, the subject for discussion will be "On the best outfit for amateur out-door photography."

To Correspondents.

*** We cannot undertake to return rejected communications.

*** Our Publishers desire us to state that next Friday being Good Friday, the News will be published one day earlier than usual. Advertisers will please note.

Scot.—Mr. A. L. Henderson, of London Bridge, was the first to propose it.

N. N.—You could get a supply, no doubt, either at Edinburgh or Glasgow; write to McGhie and Bolton, West Nile Street, Glasgow, if you have any difficulty.

F. Adams.—We are very sorry, but the Year-Book of Photography was out of print a fortnight ago.

C. Chesterman.—Please send us your full address.

Perplexed.—We have abundant reason to believe that they arise from the presence of small clots of insoluble albumen in the mixture used for coating the paper, and these clots, although scarcely showing on the face of the unsensitized paper, refuse to take up the silver solution. They generally are most numerous on the first few sheets albumenized.

H. M.—It may be copyright, and we should advise you not to sell any copies. Why not photograph the building itself, and secure a copyright in your own picture?

C. C. L.—Many doubtless call themselves photographers to the Queen with no more ground for doing so than you yourself possess, but we imagine that, according to the strictest view, the title should not be used unless some kind of warrant of appointment has been issued. 2. Why not have a phototype reduction of the letter made, and print it in your circulars and upon your mounts? 3. We are inclined to attribute them to imperfect fixation; leave them longer in the hypo, and take great care in the washing.

H. Mallins.—We do not think they have any London agent, and should recommend you to write direct.

W. J. H.—1. It is quite reliable; still, we think you would do well to work without it, as it is necessary for you to gain that experience which will render you independent of such aid. 2. You should not watch it, but keep the dish covered, and glance at it now and again. By holding it up to the lamp and looking through it you will be able to judge to some extent. No one can fully judge as to the result until the plate has been fixed, or at least taken out into a full light. 3. Yes, but we prefer to use fresh solution each time. 4. There is less objection to using this a number of times. 5. A moderate washing is sufficient; say one change of water. 6. We will consider the matter, and are obliged to you for the suggestion

J. Willis.—1. It will answer very well; nail the sheets on a light wooden framing. 2. For side light about nine feet by twelve or thirteen, and perhaps two-thirds of this for the skylight. 3. Within 12 or 14 inches.

Wm. J. T.—The reaction with iodide of starch affords strong evidence of the presence of hyposulphite, but to establish it in a sufficiently conclusive manner to support a claim in a court of justice, would involve careful and extensive analytical work. If an experiment made with a divided print, as recommended on page 113 of the present volume, does not carry conviction to the vendors of the mounts, you will have to consult an analytical chemist and a solicitor.

F. Francis.—If you have a sufficient inlet for warm air and outlet for the damp air, you will doubtless be able to dry 300 quarter-plates at a time; but unless you are pressed for time it would be well to work with less. 2. Markings are very likely to result if you do as you suggest.

Musty.—1. To give you all the directions you require would be to write a complete treatise on the gelatino-bromide process; this we can hardly do, but we should recommend you not to over-expose, and to use the ferrous oxalate developer. 2. The Autotype Company undertake such work; their address is Oxford Street, London. 3. Write to the firm and enquire.

H. D.—We fear it has found its way into the waste paper basket, but we hope not.

W. F. Bennett.—1. You would do well to add a small proportion of potassium bromide to your developer. To each four ounces add from 5 to 30 drops of a ten per cent. solution. 2. Collis to be preferred. 3. Use the bicarbonate toning bath given in the Formulary (p. 176). 4. Each set is excellent in its way, and you can only determine by considering which best meets your individual requirements.

John Mc. L.—1. Doubtless it was, but it is very likely that no inconvenience will result from the omission. 2. We know of none later. See Mr. Bird's article on page 613 of our last volume.

Subscriber.— Try soaking in weak cyanide—say 5 grains to the ounce. There is considerable risk of spoiling the negative, so you had better make as perfect a copy as possible before commencing to experiment

Emulsion.—1. It certainly does appear strange, but we are inclined to think that damp may have had something to do with it. We have found that pellicle (desiccated emulsion) which was kept in an absolute state of dryness did not gain sensitiveness by keeping, while another sample which was not carefully guarded against moisture became much more sensitive when kept for a year. 2. It is not at all necessary, as the gelatine itself fulfils the function completely. 3. We cannot tell you the method adopted by the gentleman whom you mention, but do not think anything would be gained by doing as you propose. 4. Your explanation is doubtless the correct one, and we think that the suggestion you make is a valuable one. We hope you will try the experiment, and let us know the result. The addition should be made the last thing, and we should think that 1 part for 50 of gelatine would be sufficient

Dr. Westropp.—Your original communication appears to have been lost in the post, but we have written privately to you, and hope you will be good enough to repeat your original query.

Zeta.—It is pretty clear that the mischief arises from the use of vessels of porous earthenware, the body of the vessels having become saturated with old emulsion. Discard all your present mixing jars, and use nothing but glass in future. 2. Ordinary fine muslin, such as can be obtained from any draper: but before being used it should be well washed in boiling water and dried in a place free from dust. 3. One part of water glass (soluble silicate of soda or potash) and 150 or 200 parts of water. 4. Use patent plate glass. 5. Nitric acid will dissolve it immediately; one part in four or five of water. 6. No apparatus combining all the advantages you enumerate has been invented; and we must say we do not think there is much hope of the realisation of your idea in its present form. 7. Write to the publishers on the subject. 8. No. 9. To a solution of silver nitrate, containing five grains of the salt to an ounce, add gradually enough of a saturated solution of potassium cyanide to re-dissolve the precipitate first formed. If you mix this to a cream with whiting, and rub it on the clean copper plate, a sufficiently thick film of silver will be deposited. 10. Try a 30-grain solution of chrome alum, leaving the plate in for about ten minutes.

MR. H. P. ROBINSON'S NEW BOOK.

Messrs. PIPER & CARTER beg to state that Mr. Robinson's new work, "PICTURE MAKING BY PHOTOGRAPHY," will be published very shortly, and Advertisements must reach their Office not later than Monday next.

The Photographic News Registry.

Employment Wanted.

Printer & Assist. Operator.—A. S., 47, New York-st., Manchester.
Mounter, Cutter, Spotter (lady).—H. H., 12, Croysland-rd., Chalk Farm.
Printer, Toner, General Assist.—Photo., 3, Alma Cottages, Barking-rd., E.
Retoucher and Operator, first-class.—H. S. Healey, 32, Stall-st., Bath.
Retoucher, Mounter, Finisher (lady).—B. C., 10, Patrick-st, Cork.
Op., &c. (Italian, speaks Fr.ch. & Eng).—L. S., 35, Grove-lane, Camberwell.
Printer, Retoucher, assist generally.—Argent, *Photo. News* Office.
Retoucher and Assistant Operator.—W. Leuchars, 51a, Perth-rd., Dundee.
Colourist & Ret (lady).—E. McCowen, 20, Grand Parade, St. Leonards-o-S.
Printer, generally useful.—C. R. M., Station-rd., Sleaford, Lincoln.
Operator and Retoucher, speaks French.—Franco, *Photo. News* Office.
Operator and Retoucher, wet or dry.—X. Y. Z., P. O., Bitton, nr. Bristol.
Retoucher and Assist. Op.—W. H. T., 11, Kirkwood-rd., Haverstock-hill.
Youth, to learn photography.—D. L., Pliny Villa, Godwin-rd., Forest-Gate.
Operator & Retoucher, 30s.—A. B., 21, Bethel-st., Norwich.
Operator & Retoucher (Italian).—Dal-Mistro, 64, Frith-st, Soho.
As Improver in first-class house.—W. T., P. O., Stretford, Manchester.
Gen. Assist. (21). Lond.—G. P., 6, Kensington-pk.-rd., Notting-hill-gate.
Assist. Op. & Printer in Lond.—L. W. Green, Dennett's-rd., Peckham.
Photographer of exp., free April 28.—W. F. Andersou, 5, Tarvit-st., Edinb.
Recep.-Room (Lady), gen. useful.—A. M., 28, Atlantic-rd., Brixton.

Employment Offered.

Operator, indoor or out.—C. Gillman, 107, St. Aldate's, Oxford.
Assistant, first-class.—C. Gillman, 107, St. Aldate's, Oxford
Neg. Retoucher (lady), first-class.—W. H. Mason, 89, George-st., Croydon.
Operator, clever at lighting and posing.—Artist, 22, Red Lion Square.
Operator and Retoucher, to manage.—West and Son, Eagle House, Gosport.
Printer and Assistant immediately.—S., 38, Queen's-sq., Bristol.
Neg. Ret., &c.—T. Williams, Talbot-pl., Darlington-st. Wolverhampton.
Operator, skilful & clever Ret.—S. W. Barns, 100, High-st., Ashford, Kent.
Retoucher (lady)), quick, 30/- weekly.—Stuart, 17, Brompton-rd., S.W.
Retoucher, good.—Barraud, 263, Oxford-st., W.
Assistant in Stock-dealer's Warehouse.—Ruby, *Photo. News* Office.
Youth, to develop & be useful in studio.—S. S., 55, Moorgate-st.
Assist. Operator for landscape.—Norman and Co, Tunbridge Wells.
Operator, to retouch.—T. Moss, 199, Derby-st., Bolton, Lancs.
Oper., clever with children & retouching.—Clayton, 6, Lond.-rd., Leicester.
Retoucher, to operate in principal's absence.—Reed, 16, Tottenham-ct.-rd.
Printer, Toner, Mounter, Burnisher.—Shrubsole, Davey-pl., Norwich.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1336.—*April* 10, 1884.

CONTENTS.

BROMINE AS A FOG ELIMINATOR.

LAST week we treated the subject of "Free Bromine in Gelatine Emulsions," and stated that we had first experimented with this chemical with the view of discovering its properties as a fog eliminator. Our idea was that possibly it might be capable of removing that fog which arises from the excessive forcing of an emulsion either while using the cooking or the ammonia process, in the latter case either through very high temperatures, or through the use of very large quantities of ammonia; and that as a consequence the objection to such forcing might be removed, and we might practically attain to a greater degree of sensitiveness.

In a great measure our experiments have been rewarded with success. One important point which we have been convinced of in the course of them is, that there are two distinct kinds of chemical fog, one which may be treated with success in any of several ways, and one which cannot.

We shall describe the appearance of these two varieties, which will, we think, be at once familiar to those who have at all extensively experimented with gelatine emulsions.

In the case of the first, a plate tested wet, shows no sign of the defect. It gives a bright, clear, dense image (as images on a plate used wet go), but when dry it is very much fogged. On close examination it will be noticed that the fog is almost entirely on the surface, and that the image under this fog is really dense. If the plate be thinly coated, it will be seen that the image on the back is of the same nature as that on the front.

In the case of the second, a plate developed wet shows but a thin image. There is, apparently, not much fog by reflected light, but by transmitted light there is. When a dried plate is tested, the appearances are intensified. The image by reflected light looks clearer than does that on the first-mentioned plate. By transmitted light, however, it is miserably thin and foggy looking, and the image at the back (looked at before fixing) is of the opposite nature to that on the front. It is a positive when that on the front is a negative, and *vice versa*.

If we may venture on an explanation of the cause of these two appearances, we shall ascribe the first, which only occurs in the case of a very sensitive emulsion, to an unstable condition of the silver bromide, wherein the balance may be upset during the course of drying by the action of the air, or of some impurity in it. A small quantity of a salt reducible by the developer without the action of light results, and we have the surface fog described.

We shall ascribe the second kind of fog to a granular or spongy state of the silver bromide. It is reasonable to imagine that when such a state occurs, the gelatine surrounding the particles of haloid have lost their restraining power, and that the developer may reduce the silver bromide without the assistance of light.

Taking into consideration the explanation which we have given, a little reflection will show that the presence of free bromine in an emulsion would prevent the formation of fog of the first kind during the drying of the plates, by replacing the atoms of bromine which were liberated by the action of the air, or whatever does liberate them, or by preventing altogether their liberation.

Acting on the assumption that our reasoning was correct, we performed the following experiment.

Plates were coated with a very sensitive emulsion, which gave on drying the kind of fog first described. Whilst still wet, these were dipped for half their lengths in water containing quantities of the bromine solution described in our last week's issue, varying from half-minim to the ounce, to three minims to the ounce.

The plates were left for five minutes in this very weak bromine water, and were then dried, when the following result was obtained.

The plate which had been washed with the weakest bromine water mentioned showed a marked diminution of fog on that half which had been operated upon. A plate treated with one minim of bromine solution to each ounce of water showed an entire absence of fog without diminution of sensitiveness. The same applied to a plate treated with a solution double as strong, but on going beyond this strength, there was a marked diminution of sensitiveness.

Adding to the emulsion itself quantities of bromine water varying from half-minim to two minims to each ounce, had the same effect as treating the plates with it as described. Even sprinkling the drying box with bromine water, so that there should be a drying atmosphere more or less impregnated with free bromine, was effective.

We have not experimented with free iodine as with free bromine, but from the fact that free bromine acts as a fog eliminator as effectively in the case of a bromo-iodide as in the case of a pure bromide emulsion, we presume that iodine would have much the same effect as bromine. As we explained last week, the effect of adding bromine to an emulsion in which there is iodide of silver, is to liberate iodine.

We found all applications of bromine to an emulsion afflicted with the second kind of fog mentioned, to be without result, other than the slowing of the emulsion when the quantity was excessive.

We think the use of free bromine as we have described it may be found useful in the hands of emulsion makers. It has had the practical result in our own case of enabling us to get more sensitive plates than we otherwise could. Up till the time we tried the use of free bromine the limit of sensitiveness was reached with us when we could no longer dry our plates without fog making its appearance during the process.

Mr. A. L. Henderson some time ago stated that bromine

acted as a green fog eliminator. We find that it does mitigate, to a certain extent, the green hug-bear, and on this subject, and also on the effect of hromine as a light fog eliminator, we shall shortly have something to say.

THE WOODBURYTYPE PROCESS.

(Fifth Article.)

The difficulty of obtaining a suitable paper for the Woodburytype method and the expensive nature of the machinery required for properly rolling it, have proved one of the serious obstacles to the popularisation of the process; perhaps as great as the hindrances arising in connection with the expense of the hydraulic press required for making the mould. Of course the introduction of properly prepared paper into commerce would at once remove the difficulty, and until good prepared paper can be procured in the ordinary way of business, the popularisation of the Woodbury method will be of necessity slow work.

The primary necessity as regards the paper is that the pulp should he extremely uniform and perfectly free from knots or lumps; and few commercial papers realise these conditions in a sufficiently high degree. Probably the best paper to select is a rather thin Rives paper; just such a paper as is ordinarily used for albumenizing. The paper having hecn selected, the next step is to coat it with a film of lac or other dressing, an alkaline solution of the resin being ordinarily employed, although gelatine or albumen may be used.

To preparc the lac solution, four ounces of borax and an ounce of carbouate of soda are dissolved in threc pints of water. This solution is heated to the boiling point, aud a pound of white shellac is added, the boiling being continued till the whole is dissolved. When cold, the liquor is made up to its originial volume, aud a little carmine is added to give it a faint tint; this being an advautage, as it renders it easy to distiuguish the coated side of the paper. The room iu which the coating of the paper is carried on shonld be kept warm, and it is not desirable that the temperature should fall much below 90° Fahrenheit. The sizing solution is to be filtered into a tolerably deep dish, this heing inclined a little, so as to give an increased depth of liquid in that part of the dish next the front edge of the table. Two sheets of paper are now taken, and are held by opposite corners so as to keep two edges in close contact, and this double edge is quickly immersed in the shallow part of the dish, after which the two sheets are rapidly drawn forward and brought out of the solution at the deep edge of the dish. Under these circumstances the sheets adhere hy the edges, but the liquid does not penetrate more than an eighth of an inch from the borders if the work has been successfully performed. The double sheets are now pinned up to dry, an inclined board being so placed as to catch the drainings. When dry, the sheets are separated, the most convenient course being to cut off a slip an eighth of an inch wide from one edge, and then to use a paper-knife. Still another coating is required, as, if the gelatinous impression were made directly upon the shellac-ed surface, there would be considerable probability of separation taking place sooner or later. In order to avoid this separation, a kind of emulsion of gelatine and resinous matter is used as a sort of bond of union between the lac paper and the gelatinous image. The emulsion is made by dissolving one part of gum benzoin in ten parts of alcohol, and after the solution has been filtered, it is mixed with a warm solution of one part of gelatine in nine parts of water, care being taken that violent agitation accompanies the mixing. The milky fluid is applied to the surface of the lac-coated paper by means of a soft cloth, it being sufficient to thoroughly moisten the surface; and when the sheets are once more dry, the final operation of rolling or burnishing is to be performed, the quality of the prints obtained depending largely on the care with which this part of the work is carried on.

For rolling, the sheets are placed between thin plates of burnished steel, and passed between the rollers of a powerful rolling machine capable of giving a direct pressure of ten or twelve hundredweight, and such a machine, with a supply of steel plates, may be reckoned to cost about £200, if for sheets of demy size (22½ by 17½).

When a number of sheets have been alternated with the burnished steel plates, the whole is passed several times, backwards and forwards, through the rollers, the pressure being gradually increased; and it is sometimes advisable to change the order of the sheets, and to apply a second pressure.

The rolled paper must be handled with the greatest care, so as not to crumple or fold it, and it must not be exposed to moist air, or it might swell, aud so require to be subjected to renewed rolling.

BLISTERS IN SILVER PRINTS.

The time has gone by since blisters of varying dimensions on albumenized paper were held to be the bane, liable at any time to render futile the very best intentions of the silver printer throughout the universe; and the best thanks of those engaged in work of this class are undoubtedly due to the early workers, who studied the problem, and prescribed such specific remedies as will enable anyone to avoid—or, at all events, to overcome—the difficulty, should it by chance make its appearance. As we have implied, blisters are rarely met with now-a-days, if only an average amount of precaution is taken to prevent their occurrence. Like other phenomenon, less abstruse, in which the seasons have a more or less marked influence, we find that the latter part of the spring, and the commencement of autumn, are the proverbial seasons when troubles may arise on this score. Viewing a possible recurrence of the evil in the hands of insufficiently experienced printers, has induced us once more to open up this well-nigh defunct subject.

A good deal of attention has recently been given to silver printing. Carefully prepared papers have been read before the societies, initiating valuable discussion; but few, if any, new points have been elucidated. Certainly no mention was made of blisters. Still, a repetition of sound principles and reliable formula occasionally, is advantageous; it refreshes the memory of some, while many half-forgotten points become entirely new ones to those who have entered the ranks recently.

A prolific cause of blisters of large size—sometimes as large as a hen's egg—is the use of a strong sensitizing bath, in conjunction with a highly glazed albumen surface. This mistake is often made under the notion that a highly surfaced paper must need a strong silver solution in order to get brilliancy. We have elsewhere shown this to be a fallacy, which may be verified by the simple experiment of adding slightly diluted albumen to a thirty-grain neutral nitrate of silver solution (this operation may be performed in a test-tube, and is instructive to beginners). The remedy in this case is obvious. Dilute the sensitizing solution as much as compatible, without risk of dissolving the surface, and increase the time of floating to avoid the risk of weak prints.

Another cause of blisters—one which is seldom met with, however, except among large consumers—arises from using paper shortly after it has received its coating of albumen—that is, before it has properly matured; the form of blister met with under these circumstances is very much smaller than in the previous case, and may be known partly by the repellent nature of the paper in floating on the silver bath, and partly by the extreme care necessary to exercise in handling it during the washing operations, without disturbing the homogeneity of its surface. The remedy consists in storing the sample in a moderate temperature for a few weeks.

A cause over which the consumer has less control than

either of the foregoing, results from the sizing. If the sizing given to the paper in the process of manufacture is of too hard a character to permit a homogenous tenacity being established between the surface of the paper and its facing of albumen, it is rendered incapable of withstanding the force to which it has to be subjected in the action of washing out the soluble salts. We may look upon a print during its transit through the various aqueous solutions somewhat in the light of a sponge, charged alternately with solutions of varying densities. If a sponge saturated with a dense liquid, such as hyposulphite of soda, be placed in a less dense liquid, such as water, for a sufficient length of time, an equilibrium of density between the two liquids will be established or, in other words, a perfect mixture will take place. In the case of silver prints, a similar action takes place, but with this difference: the porosity being unequal—that is, the porosity of the paper at the back being greater than on the surface—permits a freer passage for the dense liquid to pass out of the former, while in the latter, the struggle which takes place with the liquids in their efforts to equalize, causes a separation of the two surfaces which we recognise as blisters.

Among the numerous remedies suggested for this kind of blister, perhaps there is not one so efficient as the plan of equalizing the temperature of all the solutions made use of; increasing the density of the washing waters between toning and fixing, by the addition of a handful of common salt; and diluting the hyposulphite bath gradually, instead of transferring the prints directly into the washing trough; or, what amounts to the same thing, employing salt in the first and second waters after fixing. It is very seldom blisters make their appearance until the prints have left the fixing bath, and are in the act of washing. We may here mention that there is less liability to the defect when prints are face downwards during fixing and washing.

Having indicated some of the causes and their remedies, we take leave of this part of the subject, it being impossible to deal exhaustively with every phase in the space at our disposal. A defect somewhat analogous is sometimes met with, which is liable to be very troublesome unless the change of conditions which brings it about ceases; this defect is an abrasion of a portion or the whole of the film after fixing by slight pressure in handling, or the friction produced by the prints striking against the sides of the washing machine. The subject recently came under the notice of the Photographic Society of Great Britain through the medium of the "question-box," and was discussed at one of the mid-monthly meetings; several well-known experts who were present averring the defect to be uncommon, and not met with in their own practice. In the course of the discussion it transpired that a sample of the same paper sensitized, printed, and otherwise treated in London, exhibited no indications of the defect complained of; the questioner who was present attributing the defect to the lowness of temperature in the apartment where the sensitizing was conducted. This conclusion is very likely to be the right one, seeing that the occurrence took place over five hundred miles north of London.

We remember our attention being directed to a defect of this kind during a frosty season a few years ago. At that time we were in doubt whether heat or cold was the primary cause. Upon inquiry, we found the use of very hot water for washing rendered the surface in a soft state, incapable of resisting the slightest rough treatment; further, after reducing the temperature of the washing waters, we found, upon removal of the prints, and suspending them in the drying-room, without heat in the apartment, that the surface became covered with a thin coating of ice, due to the lowness of temperature; and we noticed, that wherever any part of the frozen print was handled, there the film would be disturbed.

In concluding, it might be worth while inquiring why albumenizers issue such meagre instructions with their paper, generally contenting themselves by urging weak solutions, knowing full well, as they must do, that the same formulæ will not suit each batch alike, or the same batch under unfavourable circumstances? We do not wish to be misunderstood when we say weak solutions, because many thousands of excellent prints are made on a silver bath of less than forty grains per ounce; but the conditions must be favourable. Every practical printer knows that the conditions suitable when the temperature averages 60° F. are unsuitable when there is a variation of twenty degrees above or below that standard; this variation of temperature frequently making all the difference between easy sailing, and a host of annoyances. From a long practical observance, we are satisfied that any considerable deviation in the temperature from 60° F. prevents any hard-and-fast rule being applicable in all cases; hence the necessity of additions such as alum, camphor, methylated alcohol, and other substances, well-known to the professional printer; besides the precautions already pointed out in this article.

At Home.

SENOR E. OTERO, CARRERA DE SN. GERONIMO, MADRID.

How do the public choose a studio? What guides the selection of a visitor and gives him confidence in the one case, or causes him hesitation in another? There are several good studios in Madrid, in the neighbourhood of the Puerto del Sol, and as we pass and re-pass them, unable to make up our mind, this subject actively occupies our thoughts. We want to act as one of the public, and to choose as they choose; we want a portrait taken, and to get the best value for our money.

Here is one firm that has several handsome show-cases in different parts of the town. The pictures are not only good, but they have a "go" and chic about them, decidedly taking; but when we come to the entrance of the studio itself, whither the show-cases have directed us, it is a narrow doorway, not untidy, perhaps, but with well-worn stairs that look a little mean. No; somehow, that does not give one the impression of a first-class studio. There is a something that suggests the establishment is a little "shy," and nothing has a more decidedly negative effect on a stranger than this.

It may be very foolish on our part, but we go away. At last, after more walking up and down, the decision rests between two establishments, both of them in the Carrera de Sn. Geronimo, and both with a well-to-do entrance adorned with much handsome work, displayed in excellent taste. This exhibition of specimens is, indeed, a difficult matter, if you want to please everybody: the display must not be great and gorgeous, or you run the risk of appearing vulgar; and yet a goodly collection of pictures must be shown if you wish to do yourself justice. Just now the attractions are so evenly balanced, that it is merely the proximity of Senor Otero's studio to our hotel that turns the balance. We hesitate no longer, but walk upstairs.

It is a long way upstairs. In fact, if it were not a well-known axiom that photographers are always nearer heaven than other mortals, we might have given up the search ere we reached the fourth floor, for not a word of direction was there to be seen on our pilgrimage up the broad staircase. But it is a well-appointed studio enough, when we do reach it. You enter a neat, business-like bureau, adorned with numerous pictures, while on the mahogany counter are specimens of the ordinary portrait formats.

As our Castilian is not of the purest, we demand, in the first place, somebody who can speak French. The head of the firm comes forward to help us out of the difficulty, and we soon begin to understand one another. Our

personal appearance, after being up all night in a Spanish express, is not so becoming as it might be, but still we have a burning desire to be photographed at that particular moment, and ask to have a picture without delay.

Portraits are taken from nine to three, is an announcement that Senor Otero makes to his customers; and if you are busy during that time, all will agree that six hours in the studio is hard enough for anybody.

The charge for cartes is fifteen francs a dozen; that for cabinet pictures, thirty francs. We decide upon the latter as giving a better idea of work than the smaller size, and preliminaries being so far arranged, we are requested to enter the waiting room.

We walk in. Good gracious! It is like an evening party, except that the dress we ourselves are wearing at that moment does not resemble evening dress. There is an elegant room, the carpeted floor cleared for dancing, and sitting round the apartment on green velvet settees is a bevy of fair ladies, all without their bonnets, waiting to be asked.. Their dark dresses and showy black mantillas—not five per cent. of the ladies in Madrid wear anything else in the streets—are very engaging, and their black eyes and dark eye-brows add still further to the charm. They smile and chatter without the least concern, although they evidently take the last arrival to be something of a boor, because he refuses to join in the conversation.

But M. Otero's waiting room deserves a little more description. The effect upon the stranger—even without its fair occupants—is somewhat original. It is rather dark, for the small windows it has are fitted with figured glass, and this darkness is brought about for a reason. There is, namely, at the end of the room opposite the entrance a big panel mirror rising from the floor, and the effect of this, at first sight, is that of an open door or passage. It attracts you at once, as a moth is attracted to the light, and before you know where you are, you have closed on to the looking-glass, and are facing it in a very sheepish sort of way. At some of our London theatres the green rooms are fitted in this fashion with a cheval glass, and those apartments being but dimly lighted, the effect on the stranger is the same. The mirror in these cases is, of course, for the purpose of permitting actor or actress a last glimpse of their attire before appearing on the stage, and probably Senor Otero borrowed the idea from the theatre; in any case, it is a very good one, for by subduing the light all round in this way, you see yourself in the mirror to the very best advantage.

On the right of the waiting room a door stands open, leading to a little dressing-room or *Tocador*, while a second door, that is closed, is labelled *Galeria*. Our party is soon increased by another lady, also with a smart black mantilla and jet-black eyes, and she, tripping straight to the looking-glass, is also a little surprised to find herself face to face with the mirror. But, in true Continental fashion, she is in no way disconcerted; she proceeds with her toilet, smiling contentedly at herself the while, without the least concern. She is not shy, if we are.

There are plenty of pictures to look at, and the light is not so dull that you cannot see them to advantage. There is one new pose, we remark, albeit it is a picture that would hardly be popular in this country. It might be called the Tombstone Pose. A gentleman, presumably a widower, stands with white handkerchief in one hand, and hat in the other, beside a stone monument, sacred to the memory of his dear departed. No doubt the picture here shown was executed to order, but we doubt whether the idea is sufficiently general to induce others to be represented in like manner. Instead of suggesting sentiment or pathos, the pose hints all over of rheumatism and a cold in your head.

Gradually, the ladies are summoned, one after another, to the *Galeria*; it is a question of "place aux dames," for the latest comer precedes us thither. Still, we do not complain, for our turn comes very quickly. It is a very fine studio, some forty feet long and twenty feet broad, and apparently papered with ordinary brown paper. This papering, though, being smooth and regular, has quite an agreeable effect. The room is comparatively lofty, too—sixteen or seventeen feet—one side of it being glazed. Blue curtains, simply hung on wires stretched horizontally, are used to screen the side light, and brown curtains are looped under the roof. There is no direct sunlight, so Senor Otero is able to work with a large extent of bare glass. In our case, indeed, there were probably three feet of bare glass, both side and roof, employed to take a vignetted head, cabinet size; and although, as a result, the lights and shadows were in considerable contrast, the picture was decidedly successful. It was brilliant and vigorous, without having any inky shadows. Of course, in these circumstances, a white screen was used close up to the figure on the shadow side.

Employing so light a studio, Senor Otero also takes great care in shading his lens. The advent of very sensitive gelatine plates, indeed, makes the photographer very careful of the apparatus he employs now-a-days. A little diffused light in the camera, which was of no material importance in the old collodion days, works incalculable mischief upon the gelatine film, and we have noticed of late, in light studios especially, photographers are at great trouble to cover their apparatus. Senor Otero shades his camera with a close-fitting canopy of black velvet, which projects as a hood at least two feet beyond the lens. In this way he not only provides a shade for his lens, but is quite sure no injurious light enters by the diaphragm.

An assistant poses and goes through all the preliminaries, so that when the Senor arrives on the scene, his work is lightened somewhat. Very little, however; for he proceeds as an artist should, and completes the posing and lighting leisurely after his own fashion. "But this is not a serious affair," he presently says, alluding to a morose expression on our part; "let us have something more amusing, please."

So we try to look more lively, and our friend, by way of encouragement, chats half in French half in Spanish. He is not quite satisfied with the direction of our eyes, apparently, for presently he asks us to glance round so as to look straight into the lens. "Yes, that is very well," he says at once.

The picture is taken while we thought he was but posing; it was the first time in our experience of being portrayed without knowing it. With the light at his disposal, Senor Otero required, probably, no more than two seconds for his cabinet picture, and hence he had advantages most photographers do not enjoy. But there cannot be a doubt as to the wisdom of such a course, if it can be managed. There was no opportunity for the sitter to get up an expression; no time to feel that, as you are doing nothing, you must perforce shake the head-rest behind you with your skull; in a word, there was no time for self-consciousness to obtrude itself.

We are not permitted to depart until the plates have been satisfactorily developed, and, left to ourselves, we have time to remark that English instruments and English apparatus are not unknown in Madrid. By way of conclusion, too, we may remark that the pictures, which Senor Otero was good enough to forward within the period of a week—a fashionable London studio would keep you three times as long—were in every way satisfactory. They were, indeed, quite equal to the work that the first studios of London, Paris, Vienna, or Berlin are wont to furnish, while we certainly received more attention than, in our experience, generally falls to the lot of a casual customer visiting a high-class studio in the English metropolis.

The "By-the-Bye" next week will be "Provincial Exhibitions."

Review.

ILLUSTRATIONS POUR LES MEMOIRES D'UN FOU, DE M. N. V. GOGOL. D'après l'Acteur de Moscow, M. Andréef-Bourlak. Par M. Constantine Chapiro, Photographe de l'Academie Imperiale des Beaux Arts (*St. Petersburgh*).

A MAGNIFICENT album of studies, all of them untouched, reaches us from the studio of M. Chapiro, photographer to the Imperial Academy of Fine Arts at St. Petersburg. The album itself, with ruby plush cover and gold encrusted fastenings, is rich and elegant in the extreme; but costly as it is, the book is none too fine a casket for the rare jewels it enshrines. The pictures, in a few words, represent the labours of three clever men—a dramatist, an actor, and an artist. The "Memoirs of a Madman" is a dramatic work of Gogol, in which the changes from comedy to tragedy are so vivid and realistic, that a clever actor of Moscow, M. Andréef-Bourlak, was induced to give an acting version of the work. M. Bourlak's impersonation of the madman in Moscow and St. Petersburgh has created a wonderful sensation, and M. Chapiro, the eminent Russian photographer, conceived the happy idea of photographing the actor in various phases of the rôle, and so produce some living illustrations to Gogol's text. The album, therefore, that M. Chapiro sends us, each picture faced with the speech of the actor, is in truth a mimic representation where the part of madman is exacted in all its quaint comedy and touching earnestness.

The scene is always the same; it is a simple ward in the madhouse, with a narrow iron bedstead covered with the whitest of linen. As the madman is also habited in white cap, gown, and trousers, the whole of the studies may be called symphonies in white, difficulties, by the way, that M. Chapiro has got over with consummate skill. We have not here the space at our disposal to describe the pictures at full length—how comedy alternates with tragedy—but here are a few examples.

No. 1. The poor madman lying on the bed, raises his head, and with impressive forefinger says: "To-day is one of great rejoicing; there is a King of Spain, and he has been found."

No. 2. Kneeling erect on the bed, he adds solemnly, "That King, am I."

No. 3. The madman looks intelligent, but puzzled, as he says: "I can't imagine, though, how I first found out I was entitled to the throne. What a lucky thing nobody thought of throwing me into an asylum."

The comedy goes on, but presently changes into tragedy, and the terrorised madman is beside himself with fear. He jumps upon the bed for safety, implores aid from his mother, and sees all sorts of dangers. Then he calms down once more, and looking down from the bed, sees on the floor "the sea coast on one side and Italy on the other."

In the last picture he has jumped from the bed and is sitting laughing on the floor: "And do you know that the Bey of Algiers has a wart just under his nose?" he says.

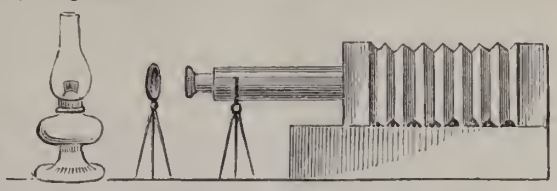
That M. Chapiro has done his work excellently well, in keenly catching the changing expressions of the actor, may be imagined from our enthusiastic remarks on the work; and we shall be much surprised if the album has not a wide circulation. The letterpress is printed in Russian and in French, but the photographs have a language that is spoken throughout the world.

PHOTO-MICROGRAPHY FOR BEGINNERS.

BY M. ALLISON.*

As some of our members are ardent microscopists as well as amateur photographers, perhaps a few remarks upon using the camera and michroscope together may prove useful, and should anyone profit, even though only in a slight degree, thereby, it will give me great pleasure to have done what lay in my power to assist him, and if possible to transfer to other persons my own ardour in this interesting branch of our art, a branch the practice of which, unfortunately, my rather weak eyesight will not allow me to pursue.

In the first place, all that is necessary for the production of photographs from microscopic slides is a good microscope, a camera of quarter or half-plate size, and a good lamp giving a steady flame. I have in my practice used a microscope of Matthews, an old-fashioned one with plenty of metal at its base, giving it a firm stand, and one which is capable of being placed in a horizontal position—the camera, an ordinary bellows-body one, being attached to the microscope by removing the eye-piece



of the latter and the lens of the former, and placing the camera with microsope attached thus in one flame, so that when the lamp is placed behind the condenser the rays of light will pass straight through the whole affair, and fall exactly in the middle of the ground glass. You can fill up the interstice betweeen the microscope and camera-front with anything suitable, such as a silk handkerchief wrapped round the brass tube; or it would of course be a better plan to make a camera front specially fit the microscope tube.

Having seen that the lamplight, condenser, object glass, tube, and centre of ground glass are all in one plane, you may commence operations with any suitable slides. In first beginning, use a one-inch or half-inch power, and practise with it until sufficient experience is obtained to warrant your proceeding to a higher power. When practicable, it is as well, or better, to use a low power, and get a sharp negative; this of course may be afterwards enlarged by the lantern to any reasonable size. This enlargement is made upon argentic enamel paper from the accompanying negative of "Saccharina Lepiscua." I do not know how many diameters it is enlarged, but you will see that one of the animalculæ is now the size of the whole of the microscopic slide, glass and all. You will also see that this "enamel" paper is very suitable for such a class of work as this, on account of its freedom from apparent granularity.

The slides with which I have worked have been almost all injected and stained histological specimens; they are about the worst subjects one could choose as a beginner, on account of their brown and red colour; the specimen photographs which I hand round will show that the most successful are from slides which have had no staining operations performed on them, such as crystals, &c., &c.

The slides should be prepared expressly for photographic purposes. If sections, the thinner they are cut the better; in fact, they cannot be cut too thin. Be content with a half-inch objective first, fasten the slide in its place, and having adjusted everything as above directed, cover your head and the camera as usual with a cloth, and focus first with the coarse, and afterwards with the fine adjustment. It is as well to remove altogether from the camera the piece of ground glass, and replace it by a piece of plane glass which has been coated with a solution of white wax in benzole, and allowed to dry. This will give a much finer and more suitable surface for the purpose than ground glass. When focussed as sharp as possible, the dark slide and slate may be inserted, and the exposure commenced. This will, of course, vary with the nature of the subject, and can only be judged by practical experience; but by using a stand and light, such as an ordinary Argand petroleum lamp, after a few trials the necessary exposure may soon be judged. By the way, in focussing, and using a half-inch objective (never mind the same not being corrected for colour) with artificial light, and getting as sharp an image as possible on the screen, it will come out sharp on development. As to development, I prefer Audra's ferrous oxalate, for with it perfect control can be obtained, and should a plate be slightly under-exposed, it may remain any length of time in the solution without fog, as in forcing with pyrogallic acid.

Again, should intensification be necessary, do not use the mercuric iodide and hyposulphite intensifier. Some of these were treated with it, and they are almost useless now; whereas,

* Read before the North Staffordshire Photographic Association.

had they been left alone, they would have made nice thin negatives, from which transpareucies could have been obtained. As regards the kind of plates most suitable for use with the microscope, do not use a quick plate; such a plate as is suitable for landscape work. One containing a fair proportion of iodide to bromide will give the best results, and be the most serviceable for use with artificial light. The exposure will vary from ten minutes to two hours, so there is pleuty of time to meditate and smoke a pipe during the operation; and as the development is done but slowly, oue plate may be exposed while another is developed. For any other information I will refer you to the excellent articles which have lately appeared in the technical journals.

NOTES ON THE LIME LIGHT.

BY T. FREDERICK HARDWICH.*

In the process known as the oxyhydrogen, or mixed gases, one-twentieth of an inch has been fonnd to be a useful size for the orificc of the burner; but, as a biunial lantern consumes a large quantity of oxygen, I have tried this year to reduce it. I find that it may be reduced to one-twenty-fifth of an inch without much loss of light, but I still give the preference to the former size when economy is not an object. The actnal size of the orifice, however, is not all which we have to cousider; the distance inwardly before the bore begins to expand must also be taken into account.

The distance of the point of the burner from the lime, measured diagonally, should be about a quarter of an inch when the angle of incidence is 45°. When the augle of incidence of the burning gases on the liue is less than 45°, the cylinder must be brought nearer. I have one burner, bent at an angle of 17°, which works best when it almost touches the lime.

I have quite discontinued working with very heavy weights on the bags, such as one and a-half or two cwts., finding the lantern more difficnlt to manage without an assistant, and the danger of accident greater. Abnndancc of light for all ordinnry purposes can be got with three-qnarters to one cwt. or an eight-foot bag, if the joints are gas-tight and the taps turned on full. I take certain precautions when working away from home, which it may be useful to mention;—1. Never allow any volunteers in the audience, who think they know "a little of magic lanterns," to come forward and help you. 2. Always strap on the weights to thc pressnre-boards, or tie them tightly with string. 3. Place the boards at a sufficieut distance from the wall so that they cannot tonch it in their desceut, and put a reliable person in charge of them, with strict injnnctions to allow no one to come near.

On the subject of "dissolving," I may allnde to the snapping noise, like that of a percussion cap, which occnrs with some burners of the blow-through kind, when there are two concentric tubes, and the outer tube of hydrogen projects beyond the inner tube for the oxygen. It was suggested to me to throw a little oxygen into the by-pass flame, and this I fonnd to answer perfectly.

I strongly advise that all dissolvers should be made with a by-pass tap to both gases.

Manufacture of Oxygen Gas.—I have a word to say on the use of chlorate of potash for preparing the oxygen. After experimenting with different samples, I am inclined to think that the kind that breaks with a conchoidal fracture, and is very hard to pulverise, is the most suitable.

Broughton's Ethoxo Lime Light.—When coal gas is not available, I still continue to use the ether process invented by Mr. Broughton, of Manchester.

In Broughton's tank the ether is not vaporised by heat, but a small quantity of oxygen is passed through it. This constitutes a source of danger, because an explosive mixture might be formed if the disengagement of ether vapour were not sufficiently copious. The oxygen should be saturated, or nearly so, after which the mixture will burn like common gas.

When you have purchased a tank, fill it with the lightest methylated ether of ·720 sp. gr., and light the flame at the jet of the lantern. If it burn yellow and luminous, like the flame of a candle, the proportion of ether will be sufficient to give you safety.

To study the colour of the flame effectually, it is not enough to turn on the tap gently and to allow it to burn against the face of the lime. The lime must be taken out of the way. Close the O tap of the jet entirely, and put on a strong pressure from the H tap of the jet until the flame shoots out, like a blow-pipe flame, to a length of six inches. You will then notice one of three different stages indicating less and less ether, before the last or explosive stage is reached.

1. In the first stage, when the ether is plentiful, the flame is yellowish, with an outer envelope of blue most marked at the base and point, the blueness being due to oxidation by the surrounding air. This flame, when allowed gently to play upon the lime cylinder, does not heat it red hot, except at the edge of the flame, but sometimes deposits carbon upon it.

2. With a smaller quantity of ether in proportion to the oxygen, the interior yellow flame dwindles away, and the outer envelope of pale blue becomes more and more pronounced, until the flame is blue throughout, with an edging of violet next to the air. This flame will heat the lime to bright redness, but it will not make it glow. By turning off the tap suddenly you find that it is not explosive.

3. In the third stage the outer envelope of violet has encroached upon the blue, just as the blue before did upon the yellow, and the whole flame is of a fine violet tint, fringed with a dull red or purple. It will now heat the lime to whiteness and make it shine, but not with the full degree of incandescence. It cannot be termed very explosive, because if you turn off the tap it goes ont quietly. I am not prepared to say, however, that it could not be sucked back or forced back into the mixing chamber.

4. In this last stage the flame is still a shade of violet; but the cone of imperfect combustion at its base, which you can easily see projecting from the point of the jet, is very much smaller in size. Instead of being three-quarters or one inch long, as it was before, it has diminished to a quarter or one-eighth of an inch, and if you find this you may be sure that there is danger.

Back-pressure valves—whether made of metal or silk—are useless for stopping flame.

My advice to persons holding crowded exhibitions is to procure two pumice chambers, to have them properly tested, and to place them—one upon the H nozzle, and the other upon the O nozzle of the tank at the end nearest the lantern. In addition to this, a back-pressure valve may be put on the O nozzle of the tank at the end furthest from the lantern, to prevent suction if a weight were to fall off the bag. In attaching the tubes, be careful to use only the thickest and best india-rubber.

Two questions have still to be answered:—Can the ether be used over and over again by simply making it up to its original bulk with fresh ether of ·720? To test this point I took five fluid ounces of ether which I had put away in a bottle as having been too often used to be reliable, and, after filling it up to eight ounces with ether of ·720, I poured it into a tank made to hold fifteen ounces. On passing the oxygen the flame burnt yellow, but slightly inclining towards blue. In half-an-hour it burnt pale blue, and in another half-hour violet. Then, in another quarter-of-an-hour, the gurgling noise in the tank became irregular, indicating that the ether was evaporating down almost to dryness, and that the last of the septa had been reached. On turning off the tap the flame went out quietly without explosion, and the tank when weighed was found to contain exactly three fluid ounces of ether. This experiment speaks for itself.

The Oxygen Bag as a Source of Danger.—This bag has been known to take fire more than once, even in the blow-through or safety process, and the cause is supposed to be an accumulation in it of a dusty or powdery substance produced by the disintegrating action of chlorine present in the oxygen as an impurity. I would suggest that a back-pressure valve should be placed on the nozzle of the bag when such a substance is known to be present. The only precantion which I take is to thoroughly purify the oxygen. Pass it through two washing-bottles, the long delivery tube of the second being closed at the end, and then perforated with a number of small holes, like what is called a "rose burner." Fill each bottle three-quarters full of solution of common washing soda in the proportion of a quarter of a pound to the pint of water, and the oxygen will then be nearly or quite free from smell. No water will enter the bag if four or five feet of india-rubber tubing of half an inch internal diameter be used to connect it with the nozzle of the second purifier.

After I had finished my "notes," and made them almost ready for the printer, I saw a report of the disastrous explosion at the Chadderton Town Hall, and of the evidence given by Professor Roscoe. He entirely condemns the use of the ethoxo light. If he had tried it, I think he would have come to a different conclusion.

The cause of the Chadderton accident was undoubtedly the

* Abstract of a paper read before the Edinburgh Photographic Society.

forcing of a little ether backwards into the oxygen bag from absence of a reserve chamber, which ought to have been provided.

NOTES ON THE LIME LIGHT.

On Rev. T. F. Hardwich's Paper.

BY LEWIS WRIGHT.*

As regards the light from jets, those I have most used have been only 1 mm. (one twenty-fifth) in bore, and I get with these ample for a disc 16 feet in diameter. I suggest that it would be a good thing if some Society would prepare and issue a "standard slide," of which copies could be had printed to one uniform density and transparency. I think the best plan for the internal bore is to use a "broach" such as watchmakers employ, which is very slightly tapered, almost imperceptibly. Then if a slightly taper steel wire be scored longitudinally, with coarse emery paper, the bore can be beautifully polished at any time by turning it round. At one-eighth inch from orifice the taper should be widened. As to distance from the lime, Mr. Hardwich, I think, reckons his "angles" with the surface itself. So reckoned, I prefer about 35°, which keeps the nipple from casting a shadow when of proper shape. But with most nipples, on trial, I find more light the nearar the orifice, and the practical point seems determined by the distance needed to avoid clogging up. With large orifices the distance does get greater. I begin with 1 cwt., and as pressure gets down put on ½ cwt. more to finish; but I certainly find more pressure, up to the capacity of the orifice, gives more light within at least certain limits. You do not, however, get light in proportion to extra gas. The best jet I know is one brought out by Mr. Place, I believe in answer to my own pressing in part; it has the great merits of cheapness, and raising the lime the proper distance at each revolution. It was this latter I so much urged upon him some time ago.

I, too, find "Excelsior" limes the best, and especially in accuracy of form. But of late, urged thereto by Dr. Maddox, so well known for his interest in photo-micrography, I have turned my attention once more to oxide of zinconium. I find the oxide can now be procured considerably cheaper than formerly.

Like Mr. Hardwich, I think the "skeleton" boards very unsteady. I never use them, preferring plain boards, with a hinged double leg at one end, and a hinged stay or stretcher which ties to it. The support is the full width, and cannot slip; and when the gas is half gone, the stretcher unties and boards go down on the floor.

It is impossible to say too much in favour of the double washing of oxygen with soda. Not the least advantage is, that yo do just as well with common chlorate at 7½d. to 9d. per pound. I only now use about one-fifth of manganese, and find the gas comes off much faster, so that I often get the bag filled in twelve or fifteen minutes—indeed, the difficulty is to avoid a "rush" of gas.

In regard to the ether light, one main point in my opinion—and here I differ very seriously and strongly from Mr. Broughton's printed directions—is to turn on the hydrogen tap from the tank first, so as to vent all pressure from the ether vapour.

I do not think anyone can use the ether light safely who has not clearly before his mind his two special dangers, and their reasons, and their method of prevention. They are (1) the risk of want of saturation; and (2) that of "back pressure." I do not think a few brief directions, and the statement that all is safe if these are followed, give that impression to an operator, and I would urge more detailed instructions very strongly. Mr. Diggle, at Chadderton, evidently had not the faintest real conception of the very serious danger when he found ether in the supply tube—I believe it was in the bag as well. He thought that when he had "poured it out," and the jet lit, all was right. The fact was, as I believe, that at first the oxygen far outweighed the vapour as regards oxygen-supply (and it was the bag which exploded). But by degrees the oxygen in the bag got exhausted, while the ether in the bag (I can't understand the bag catching fire unless ether was in it) still evaporated at the same rate, until at last it was bound to reach the exact explosive point.

All this attaches great importance to the new pumice safety-chambers. If they stand exhaustive testing, they will be a great boon and comfort to many. Hemming's packing has failed, and so has Gurney's water safety-chamber, and gauze is a sheer delusion; while anything that pretends to be "safe," and is not, is obviously more harm than good, since reliance is placed upon it which there is nothing to justify, and other care which might prevent accident is neglected. But a *bona fide* safety arrangement is another thing; and I hope Mr. Broughton's pumice-chambers may ere long receive sanction which cannot be displaced.

* Abstract of a paper read before the Edinburgh Photographic Society.

PHOTOGRAPHY CONSIDERED AS THE WORK OF RADIATION.

BY CAPTAIN ABNEY, R.E., F.R.S.

The sixth and last lecture of this series was delivered on Saturday last, April 5th.

Drawing the attention of his audience to the green bromide film on which he had photographed the infra red rays at the last lecture, the Lecturer said he could show them how he could bring this back to the orange state simply by rubbing. This was done, and showu in the lantern, and photographs of the action of the spectrum on the different films were shown to illustrate the different states in which bromide of silver could be obtained in a film. Photographs of the infra red end of the spectrum, taken by the prismatic spectroscope and by the Rutherford grating, were then shown.

The carbon points of the electric arc were then projected into the camera, with a piece of red glass intervening. A wet plate that had been exposed to the light was then placed in the camera, and a photograph reversed of the carbon points was obtained, showing that red rays could produce reversal. An exposed wet plate was then placed in the spectroscopic camera, and a reversed photograph of the red end was obtained. This phenomenon, said the Lecturer, was a very old one, but the explanation of it was by no means so ancient; it had been found that it was due to oxidation of the reduced salt under the influence of radiation, for if no oxygen or similar element were present, no such thing took place.

The Lecturer now said he must touch upon an important and interesting part of his subject, the vexed question of photography in natural colours. He could not enter into all the investigations that had been carried out with this end in view, but he would describe and illustrate the most important of them. From a little book he had with him ("The Chemical Effect of the Spectrum") he would read a short extract, detailing the experiments of Dr. Seebeck in 1810, who, by exposing a darkened chloride plate to the spectrum, got an imperfect reproduction of its colours. With the purer spectrum that had since been obtained, it was possible to get better results than Dr. Seebeck had got, and he would ask for the daylight to be let into the theatre whilst he passed a few specimens round.

On gelatino-chloride plates or paper they would see fair results, but the best were on Daguerreotype plates and the ferrotype plate he passed round. Reference to the work of Becquerel, Niepce, and others was then made, these workers having made considerable improvements in the method. Unfortunately, the results could not be rendered permanent, and would not stand a very long exposure to daylight. He (the Lecturer) had tried to get photographs of the spectrum in its natural colours without letting oxygen have access to the plate, and the result of his researches showed that oxidation played an important part. The explanation of the colour, he believed, was, that the particles were of different sizes, just as they got silver bromide of different colours according to the size of the particles. If he was asked whether he considered photography in natural colours to be possible, he said that in science he knew, and they knew, of no such word as impossible; and if scientific men would only work at it as they had worked at other problems, he saw no reason why photography in natural colours should not come to pass within (say) the next ten years or so.

Turning to another subject, the Lecturer went into the question of adding dyes to films containing salts of silver, demonstrating by experiment the effect of eosine and cyanine blue upon the plate. The sensitizing effect of one silver salt upon another was then shown. The Lecturer concluded with some experiments with rotating discs, in which an effect, which would generally be put down as an optical illusion, was shown by photography to be be perfectly genuine.

The very hearty applause at the close testified to the success of this series of lectures, and many were heard to express regret that they had come to an end. Throughout the series Capt. Abney was ably assisted by Mr. C. Ray Woods and Sergeant Jackson, R.E., the former looking to the working of the apparatus, and the latter to the photographic manipulations.

Notes.

Our Paris contemporary, *la Nature*, is rather behindhand in its news. Last week it gave an account of Ericsson's sun steam-engine, of which an illustrated description appeared in these column three months ago.

We are glad to hear that Mr. Cecil V. Shadbolt is going on with his successful photo-balloon work. He makes his first ascent this year next Monday, taking a voyage in the "Sunbeam," which is arranged to start from Birmingham on Bank Holiday. Says Mr. Shadbolt: "We are now building a beautiful little balloon—which, we hope, will carry three passengers—alternate gores of red and yellow; this, in consequence of the prospect of a large number of ascents during the present year. The No. 2 balloon is to be ready early this summer."

Anderson's charming story about the Emperor's new clothes will be fresh in the recollection of many; how two rognes received payment for pretending to weave the Emperor a suit of raiment so fine that nobody could see it, and how the fraud was only discovered when a little boy cried out that the Emperor had nothing on. Science seems now to have the power to which the rogues in question only pretended, for Mr. H. F. Read, of Brooklyn, has succeeded in drawing platinum wire so fine as to be invisible to the naked eye. The idea of producing a wire so delicate was to employ it for the cross threads in a telescope, for which its perfect opaqueness rendered it particularly applicable; but it seems that the wire is actually too fine for the purpose. Curiously enough, Mr. Read's wire can be detected by touch, albeit it is invisible under ordinary circumstances.

Photographers have now little difficulty in obtaining good samples of gelatine, but as they often employ it, not only for making emulsion, but for mounting, &c., it is as well to know an easy and simple way of testing samples for colouring matter, and impurities that are found in the commoner samples of gelatine and glue. Weigh a small piece of the material carefully, and suspend it for twenty-four hours in cold water. As the glue or gelatine swells, the colouring matter subsides; weigh again in its moist state, and the greater the increase in weight—the greater its power to absorb water, that is—the better is the material. When dry, you may weigh again, and the difference in weight between the dried samples tells you, of course, how much impurity there is. This test is taken from the *Tischler Zeitung*.

The value of good glue for mounting is just now all the more important since they say our supply of gum-arabic is getting cut off. As most of our gum-arabic comes from the Soudan, the import has of late almost ceased, thanks to the war, and the stock in the hands of London brokers is rapidly decreasing. Sweetmeats take up much of the gum imported, jujubes and gum drops containing something like thirty per cent., while some purpose or other is found for it in almost every kind of manufacture. About a million pounds annually of the product comes from the Soudan, so that naturally some anxiety exists about the supply.

While Mr. Darker was exhibiting his lantern polariscope at the last meeting of the South London Society, he used a small spirit lamp to yield the light required for his manipulations. It appeared to us that the alcohol flame was tinted with the sodium yellow, perhaps by soaking the wick in a solution of common salt and drying. At any rate, the light afforded was a convenient one, and, while strong enough for the purpose, it did not in any way interfere with the brightness of the image on the screen.

The new edition of Magnin's exhaustive treatise on Bacteriology, recently published at New York by Dr. Sternberg, affords striking illustrations of the solid work which photography may perform. The heliotype plates of the bacteria found in the yellow fever blood, and in the lesions of various diseases, are striking proofs of Dr. Sternberg's skill and patience. Few persons can appreciate the enormous difficulties of this class of work.

The lantern display at the Photographic Society on Tuesday night was certainly a good thing, only there was too much of it. There were good lantern slides, and there were bad lantern slides, and unfortunately the latter were accompanied by the most talkee-talkee; so that just when the slides ought to have moved briskly, they halted altogether, and mediocrity was accompanied by verbose explanations. The best things undoubtedly were Professor Donkin's Alpine pictures, which only monopolised five minutes from first to last.

By the way, why should it be deemed a virtue to take architectural views with a drop-shutter? One of these days we shall have held up for our admiration an instantaneous view of a milesone taken with some patent lightening snap-drop, and shall be asked to bear witness as to its absolute sharpness. Can it be that there are enthusiasts who imagine that quick exposures were invented for the pourtrayal of monuments and cathedrals, and that drop-shutters are particularly useful for taking church steeples and ancient ruins?

Who invented Baker Street as a photographic resort? It is an interesting question that is not readily answered, and as time goes on, the reply will be still more difficult. But we suppose Messrs. Southwell Brothers had more to do with the matter than any one else, a firm which, in the "palmy days," it may be remembered, kept three studios going all day long. From seventy to one hundred pounds daily were the average takings of the big Baker Street firm in those days, when cartes-de-visite were newborn, and when three guineas a dozen were sometimes asked for them.

Spurious photographic lenses, with the brass work neatly made, and sometimes engraved with the names of reputable makers, have been extensively sold in several auction-

rooms in London during the past few months. The glasses appear to be any convex lenses which come to hand, and the instruments are evidently made with a deliberate intention to defraud.

All photographers are interested in putting down a traffic of this kind, and although an auctioneer is not ordinarily responsible for the goods he sells, we imagine that if cautioned as to the fraudulent nature of goods from a certain source, he might get into serious trouble if he persisted in selling similar articles. Those who meet with spurious lenses at sales should mention the matter to the auctioneer, and let us have particulars.

To have one's photograph exposed for sale in shop windows is now-a-days evidently regarded as an important step towards obtaining a position within that charmed circle—society. Mr. Laurence Oliphant, one of the shrewdest and most brilliant writers of the day, in his clever novel "Altiora Peto," makes a wealthy and vulgar financier describe how he and his wife managed to secure recognition by the "first circles." In the course of his narrative, the financier says: "Then we began to give little dinner parties, and Dashington asked our Duchess here to invite us to her parties; we worked the press and the photographers." And, so he adds afterwards, "What with notices in the paper, and photographs in the shops, and financial plums for the poor aristocrats, and pretty women for the rich ones, we got to where we could give entertainments on a large scale, and ask some social lions." It is but fair to mention that the wife of the financier is very good looking, an important factor where photography is concerned.

A propos of pictures of "leaders of society," the camera, which has often been accused of want of flattery, never perpetrated anything so vulgar and untruthful as a series of coloured portraits of aristocratic ladies now being published monthly by a society journal.

Photography may now be said to attend us to the grave. Early on Saturday morning, just before the funeral service commenced, the coffin containing the remains of the late Duke of Albany was photographed as it rested on the bier under the crimson pall.

The evidence given at the adjourned inquest on the Chadderton explosion somewhat negatives Mr. W. Broughton's theory—given in the "Notes" of the 28th ult.—that the explosive compound was not formed in the bag on the evening of the exhibition, but some time previously. Mr. Diggle, the photographer who manipulated the lantern, went, it appears, to the Hall about half-past five o'clock in the afternoon to prepare for the exhibiton. Having all ready with the exception of the weights, he left the room to go for them, giving instructions not to allow anyone to enter in his absence; on his return, he found two persons on the top of the staircase. He then found some one had been tampering with the apparatus, as the burners would not light, and on examining the oxygen tube found liquid ether in it to the extent of two ounces or so. This was emptied, and the lantern worked all right for an hour, and exploded without the least warning. Beyond this, very little was stated which threw any light on the immediate cause of the accident.

It is odd to find photographs produced as evidence of a person's insanity. In a case last week before Mr. Justice Denman, one of the Lord Chancellor's visitors in lunacy, in speaking as to the alleged unsoundness of mind, said the person in question produced some photographs, among them a photograph of Mr. Bradlaugh, and pointing to it, said;—"Is not that a beautiful face?" If this is considered a proof of insanity we shall have to be very careful in showing photographs. It is no uncommon thing, for instance, for mothers to produce some abominably ugly portrait of a child and go in raptures over it, pointing out beauties which nobody but themselves can see. Besides, beauty is a matter of opinion. There may be people who, without being mad, may consider Mr. Bradlaugh beautiful. Besides, is there not a process of beautifying known as retouching? The witness thought the person who called upon him to admire Mr. Bradlaugh's photograph was a little "touched," but might it not be that it was Mr. Bradlaugh (we mean his photograph, of course) that was "touched?"

Oliver Wendell Holmes, whose name is familiar to readers of these "Notes," as to every other reader who delights in the "well of English undefiled," dwells with touching emphasis upon the value of a photograph. In one of his Autocrat series—the best books ever written, as we heard an enthusiastic admirer call them the other day—he thus describes an old man's impression of a mother who has died young: "Mother she remains till manhood, and by-and-bye she grows to be a sister; at last, when wrinkled and bowed and broken, he looks back upon her in her fair youth, he sees in the sweet image he caresses, not his parent, but, as it were, his child."

The gentle American poet here speaks, of course, only of the "image" in the old man's brain as in the days before photography. "If they had only taken pictures then, as they do now," is the old man's plaint. "All gone! all gone! nothing but her face as she leaned on the arms of her great chair; I would give a hundred pounds for the poorest little picture of her, such as you can buy for a shilling of anybody that you don't want to see."

To cement brass or other metal upon glass, M. Puscher employs a resin mixture made up of 1 part caustic soda, 3 parts resin, and 5 parts water, rubbed up with half its weight of plaster of Paris. Zinc white or white lead may be used instead of plaster of Paris if a slower-drying cement is wanted. Herr Wiederhold prefers to use a fusible alloy for cementing brass work to glass, made up of 4 parts lead, 2 parts tin, and 2½ parts bismuth, which melts at the temperature of boiling water; he presses the glass into the molten metal, and allows the same to cool in a warm place.

Patent Intelligence.

Applications for Letters Patent.

5817. JAMES SYRUS TULLEY, trading as Napoleon Syrus, 235, Balls Pond Road, N., Middlesex, Photographic Artist, for "Improvements in photographic studio backgrounds."—Dated 2nd April, 1884.

5911. WILLIAM MIDDLEMISS, Holmfield Mill, Thornton Road, Bradford, Yorkshire, Manufacturer of Photographic Apparatus, for "Improvements in photographic cameras."—Dated 4th April, 1884.

Specifications Published during the Week.

4152. DE ZUCCATO, E.—Producing prints or transfers of photographic pictures.

4153. DE ZUCCATO, E.—Producing prints or transfers of photographic pictures.

4154. DE ZUCCATO, E.—Producing prints or transfers of photographic pictures.

The full text of these will be found on page 138.

Patents Granted in America

295,608. CHARLES F. ADAMS, Worcester, Mass. — "Solar camera." Filed November 16, 1883. (No model).

Claim.—1. In a solar camera, the combination, with a reflecting-mirror and the adjusting-gear of the camera, of an adjustable hinge for attaching said mirror to said adjusting-gear, substantially as shown and described.

2. A bent hook-piece, having projections on its top part in combination with, and attached to, one side of a reflecting-mirror, in connection with cube-piece and screw, to raise or lower said mirror, substantially as shown and described.

3. In a solar camera, the combination, with an adjusting-gear and a screw for tipping the mirror, of the cube piece, attached to hook-piece on the reflecting-mirror, substantially as shown and described.

4. In a solar camera, the combination, with an adjusting-gear, of an elongated nut pivoted thereto, and the adjusting mirror-screw, substantially as shown, and for the purposes stated.

5. The combination, with the frame part, having a slot for the mirror-tipping screw, of the adjusting-gear, having a flange, substantially as shown, and for the purposes stated.

6. The combination with the frame part of camera-box, provided with shadow grooves and ridges, and having a diaphragm or plate therein, substantially as shown and described.

7. The combination with the camera-box of a wedge-shaped piece used to make the lines of the picture perpendicular on the screen, and adjustable shelf, substantially as shown, and for the purposes stated.

8. The combination with the reflecting-mirror, adjusting gear, tipping mirror-screw, and frame part, of the box part, and parts attached thereto, hinged or pivoted to said frame part, and reflecting-mirror, all to be used for a vertical camera, substantially as shown and described.

9. The combination with the frame part and the reflecting-mirror, hinged to the adjusting-gear and tipping mirror-screw of the camera-box, and parts attached thereto, all so constructed and arranged that the instrument may be used either as a right-hand or a left-hand camera, substantially as shown and described.

295,638. AUGUST HERZOG, Guttenberg, N.J.—"Photographic camera." Filed Nov. 2, 1883. (No model.)

Claim.—1. The combination of a supporting base-frame having forward-extending guide-rods, a rear frame hinged to the base-frame, means for adjusting the rear frame to the proper inclination on the base-frame, an extensible camera, a lens-carrying frame, and means whereby the lens-carrying frame can be adjusted on the guide-rods, substantially as set forth.

2. In a photographic camera, the combination of a supporting base-frame, a rear frame having means for supporting the ground glass and plate-holder, said rear frame being hinged to the base-frame, a camera in front of the rear frame, a plunger pivoted to the rear frame, a fixed cylindrical socket of the base-frame for guiding the plunger, and a clamping-screw for fastening the plunger to the socket, substantially as specified.

3. In a photographic camera, the combination of a supporting base-frame, a rear frame having means for supporting the ground glass and plate-holder, horizontal guide-rods made of two hinged sections, the shorter of which is applied to the base-frame, an extensible camera having lens-carrying frame, and means whereby the lens-carrying frame is secured to the guide-rods, substantially as and for the purpose set forth.

4. In a photographic camera, the combination of a supporting base-frame, a rear frame having means for supporting the plate-holder and ground glass, horizontal guide-sections made of two hinged sections, the shorter of which is applied to the base-frame, an extensible camera having a movable lens-carrying frame, means for guiding the latter on the guide-rods, and means for retaining the longer rod-section in upright position on the lens-carrying frame, substantially as set forth.

295,688. JUAN DE M. TERREFORTE, New York, N.Y., Assignor to himself and Antonio M. Nolina, same place.—"Art of printing and mounting photographic pictures." Filed June 27, 1883. (No specimens).

Claim.—The method herein described of taking and mounting photographic pictures, which consists in preparing upon glass or other suitable surface a film of dry collodion, then spreading upon the collodion film a sensitive coating of gelatinous or albuminous emulsion containing nitrate of silver, then drying the same, then printing and developing the picture in the ordinary manner upon said sensitized coating, then attaching paper to the picture by applying paper that is faced or coated with plain moist gelatine or albumen to the picture upon the glass, then allowing the paper to dry under pressure in contact with the picture, and then stripping the paper, and with it the picture, from the glass, all substantially as herein described.

MISCELLANEOUS LABORATORY NOTES.

BY J. VINCENT ELSDEN, B.SC. (LONDON), F.C.S.

IN photography, as in most other branches of practical science, a single experiment often suggests so many others, and leads the investigator into so many bye-paths, that, to follow out completely all his divergent ideas would be an almost endless task. The following have been selected from a crowded note-book as being, even if incomplete, of possible interest to photographers.

Hypo test-papers.—I had often wondered whether some method could not be devised for making test-papers for detecting small traces of hypo, but had by some means got the idea that the blue colour produced by iodine and starch was not permanent, having seen it so stated in chemical text-books. Having, however, prepared a solution of starch and soaked a filter paper in it, I immersed the paper in a moderately-strong solution of iodine in alcohol. The paper, when dry, was now of a dark purple colour, and, being cut into strips, was exposed to bright light for a period of more than two months. The colour remained unchanged, and when wetted became bright blue. These papers I found to answer most perfectly as a ready and delicate test for hypo; for by placing a portion of a strip in contact with an imperfectly washed gelatine negative, the bleaching action of the hypo was readily perceptible, owing to the contrast when compared with the unaltered portion of the test-paper. Possibly photographers may be induced to try this plan, and keep a few hypo test-papers always at hand, in order that no gelatine negative may be varnished until the last traces of the fixing solution are removed. I have not tried how long these papers will keep their colour, but simply state the results of this single experiment.

Experiment on green fog.—The following memorandum of an incomplete experiment on green fog may be of interest, especially as it bears upon some recent theories respecting the cause of this undesirable appearance. An *unexposed* plate, immersed for some time (a few minutes) in sulphite developer, gave abundant green fog, having under the microscope the granular appearance of reduced silver. Nitric acid caused its immediate disappearance, but hydrochloric acid changed it into *red* fog. This looks as if the green fog, in this case, were finely divided metallic silver, which, when changed into chloride by the hydrochloric acid, gave the appearance of red fog.

On fixing plates containing iodide.—One great objection to the use of iodide in emulsions is the length of time which the plates take in fixing. It is well known that the solubility of iodine is largely increased by the presence of a soluble iodide, potassium iodide solution being a common

solvent for this element. Experiments were therefore made to ascertain the influence of soluble haloid salts on the rapidity of solution of silver salts by hyposulphite. Rough preliminary experiments only have so far been attempted, but the results obtained show that they are worth repeating upon a more elaborate scale. Thus, sodium chloride appeared to increase the solubility of silver chloride in sodium hyposulphite. Potassium bromide and iodide appeared to have a similar, although perhaps not quite so marked an influence upon the solubility of silver bromide and iodide respectively. When opportunity permits I shall try the influence of these salts in the fixing bath; for prolonged fixing is not only trying to the patience, but it is a most fertile source of blisters and frilling.

New organic iron developers.—Ferrous succinate has a marked reducing action upon silver bromide, and acts as a feeble developer. The solution was made by adding potassium succinate to a solution of ferrous lactate in water, and dissolving the precipitate of ferrous succinate in ammonium tartrate. Perhaps a stronger solution would produce still more marked results.

The ferrous lactate is easily soluble in warm water; but the solution appears to have no developing action, even when made alkaline after adding tartaric acid to prevent precipitation of the iron. If to the aqueous solution of ferrous lactate even a small quantity of neutral potassium oxalate is added, the solution at once becomes a powerful developer, probably owing to the formation of ferrous oxalate by double decomposition. I am hoping to be able to compare this "lactate developer" with the ordinary oxalate process. One great advantage is its extremely easy preparation.

Action of potassium ferrocyanide on haloid silver salts.—The following observations are the results of experiments made some time ago, in company with Mr. E. H. Hills, and although circumstances have prevented their completion, some interesting facts have been established. When silver bromide or chloride is boiled with excess of potassium ferrocyanide solution, the precipitate of silver bromide becomes green in colour, and so finely divided as to run through the filter. The chloride is much more easily acted upon than the bromide, and the iodide is only decomposed partially by very prolonged boiling.

The same experiment was next performed in the cold. Silver chloride was placed in a weak solution of potassium ferro-cyanide, and in a few days the solution no longer gave any reaction with ferric chloride. After four days, however, neither the bromide nor iodide experienced any alteration in the cold solution.

In all cases where alteration had occurred, silver was found in solution, and basic iron was precipitated by prolonged boiling, showing the probable presence of silver ferro-cyanide dissolved in potassium cyanide. This view was strengthened by subsequent experiments with silver ferro-cyanide, which, on boiling with water in an open dish, invariably deposited ferric hydrate, silver cyanide remaining in solution.

Examination of the greenish precipitate, which replaced the haloid silver salt after decomposition by the ferro-cyanide of potassium, showed the probable presence of a ferro-cyanide of iron, which passed easily by oxidation into Prussian blue. Thus the addition of an acid immediately gave Prussian blue, as also did simple exposure for some time beneath water. These results prove—

1. That haloid silver salts are completely decomposed by potassium ferrocyanide, silver chloride easily, and in the cold, silver bromide and iodide with more difficulty, or on boiling. The products of the reaction appear to be silver ferro-cyanide, potassium cyanide, and a ferro-cyanide of iron.

2. Silver ferro-cyanide is decomposed by simple boiling with water, basic ferric hydrate being deposited, and silver cyanide being formed and held in solution probably by a cyanide of iron.

In Abney's "Photography with Emulsions," page 13, the following reaction is given:—

$$4Ag_2Br+2K_6Fe_2Cy_{12}=3K_4FeCy_6+Ag_4FeCy_6+4AgBr$$

also the following:—

$$Ag_4FeCy_6+4KBr=K_4FeCy_6+4AgBr$$

It is difficult to see how this latter equation especially can hold good, seeing that the substances produced on the right hand side of the equation would immediately react upon one another in the manner indicated above; for in one experiment, silver bromide was left in contact with a weak solution of potassium ferro-cyanide for some days, after which not a trace of ferre-cyanide was found in the solution, although the precipitate yielded an abundance of Prussian blue when well washed and treated with ferric chloride This points to the following reaction having taken place—

$$4AgBr+K_4FeCy_6=Ag_4FeCy_6+4KBr$$

which is in direct opposition to the equations given above.

I give these equations for the sake of illustrating the interest of these reactions in photography, and not by way of criticism; for the whole subject of the action of ferro-cyanides upon haloid silver salts is so complicated that I have not had time, up to the present, to make more than a few preliminary investigations.

DRY PLATES IN THE TROPICS—DO THEY KEEP?

BY HERBERT MANNERS.

Much has been written during the past year regarding the keeping qualities of dry plates, both before and after exposure. Complaints have been frequent of loss of sensitiveness, frilling, fogs (green, red, grey), and other minor evils. In fact, like the old nitrate bath, it seems the rule to put all failures down to the plates. Having carefully tested the plates of five different makers, besides those I generally depended on, I found that those of the good makers, if carefully kept in an air-tight tin box, would retain their good qualities for a year at least, provided they were carefully packed in the first instance; but it is the packing that the makers of many good but cheap plates fail in. The plates of several makers are packed face to face, separated only at the opposite sides by small pieces of thick bent paper, so allowing a free space between each plate. These all keep perfectly, the only difference after a year's keeping being a mark on the margin of plates where the paper presses; but this is of no consequence.

Some plates worked beautifully when first got, but will not keep; not, I think, from any defect in the plates themselves, but from the way they are packed. Those in grooved boxes are not good, as they take up nearly double the space of the others, and if roughly handled or subjected to any pressure, the sides and covers of the card boxes crack and admit light. It seems that the plates packed in very close contact sweat, and decomposition of the film sets in from the edges, spreading rapidly when the film is not protected by the tissue paper. I am confident that a little more care taken in the packing of many of these cheaper makes of plates would enable them to be got out and used with certainty; but until this is done I shall stick to the best makers in spite of the great difference in cost. Though an indigo planter, I work photography throughout my district (Tirhoot) professionally, but only charge my friends the actual cost to enable me to defray the expenses of working my hobby, which I need hardly say is an expensive amusement. Could I depend on the cheaper plates I should most certainly use them, for there is a considerable difference between 17s. and 26s. 6d., especially in these days, when the rupee means only 1s. 7d. instead of 2s. But as my work generally consists in my having to send my camera on before on a coolie's head, and riding twenty or thirty miles to take a group or bungalow, it does not do to have any doubt

regarding the plates, as I always develop on my return home, where I have everything handy. Many of even the best plates frill in the hot weather, the heat in the dark-room being intense, and of course a punkah is out of the question. This might be greatly obviated by the plates having the edges ground before coating, so that the film might take a firmer bite at the edges. Why do not the best and dearest makers do this? Ground edges were always advised for the old wet collodion. Why not with dry plates also? It would often save a good negative.

While on this subject, I must draw attention to the great variation in the prices of the plates charged by the makers themselves, and of the same plates got through one of the numerous dealers. It is a puzzle to myself and many others when looking over the advertisements in the weekly journals. For instance, take certain instantaneous 12 by 10, quoted by the makers at 26s. 6d., and the same maker's plates by the dealers at 22s. 6d., being a difference of 3s. 6d. in the dozen. This should not be; but it is obviously unfair that those who, like myself, prefer to import their plates direct from the makers, should be charged more for them than if obtained from a dealer in photographic stores. Again, it would be a great boon to us dwellers in exile in these distant lands if all advertisements gave prices and discount; so many articles are advertised without the prices being noted.

Correspondence.

THE METRICAL SYSTEM.

Sir,—Granting that there is much truth in what you say in last week's "By-the-Bye" as to the advisability of adopting the metrical system, I should like to ask why we should adopt the metre instead of the yard, when, as you say, it is acknowledged that the data assumed by the French are incorrect? It is well known that if by any chance our standard yard should be lost, it could be replaced by the determination of the length of a pendulum beating seconds at a certain level. This seems to be a more scientific method than the other. The late Sir John Herschel wrote on this subject, and the arguments in his "Popular Lectures" appear to be absolutely convincing. A decimal system has advantages, but why should it not be based on our yard measure, the length of which can always be accurately known, instead of that adopted by the French, and which may almost be called arbitrary?—Yours truly,

A. Brothers.

BROMINE AND IODINE AS DESTROYERS OF THE LATENT IMAGE.

Dear Sir,—In your article on "Gelatine as a Bromine Absorbent," you mention some interesting experiments on the effect of bromine in destroying the latent image. You say: "The effect of the free iodine appears, however, to be very similar to that of free bromine;" but in some experiments I made, using iodine instead of bromine, although I succeeded perfectly in destroying the latent image of an exposed gelatine plate, I found, on exposing the film in the camera and developing, a very weak *positive* was produced. This reversal of the image was due, no doubt, to the presence of a trace of the free iodine, which is well known to act as a powerful oxidiser. In making further experiments, I should be inclined to give the gelatine film an after-wash in a very dilute ammonia bath, which would no doubt eliminate every trace of the haloid.—Yours truly,

Arnold Spiller.

HISTORICAL ACCURACY.

Sir,—Allow me to correct a little error that occurs in your last report of the London and Provincial Photographic Association, whereby I am made to attribute Dr. Monckhoven's carbonate of silver process to Captain Abney. It was the method introduced by the latter of emulsifying washed bromide of silver that had been precipitated in the presence of a small quantity of gelatine that I said had in my hands given a fair quality of emulsion, provided that it was not attempted to get a quick one.

Whilst on the subject of historical accuracy, I would ask Dr. Eder what are the grounds upon which he divides the credit for the collodion process between Archer and Fry? Some zealous friend did, indeed, in the early days of photography, advance large claims for Mr. P. W. Fry, but these were afterwards, if I remember rightly, narrowed down to diligent practice, and to the introduction of the use of gutta-percha in collodion, by which he stated that in addition to toughness he obtained greatly exalted sensitiveness. In other hands, however, this result did not ensue.—I am, yours obediently,

W. E. Debenham.

Proceedings of Societies.

The Photographic Society of Great Britain.

The ordinary meeting of this Society was held on Tuesday, the 8th inst., at the Gallery, 5a, Pall Mall East, James Glaisher, Esq., in the chair.

The minutes of the previous meeting having received confirmation,

Mr. Robert Tandall was admitted a member.

The Chairman then stated that the exhibition of slides, which he hoped would prove technically instructive as well as interesting, would commence. He pointed out and traced the gradual progress as regards not only the production of the negative, but also of the slide, and expressed a hope that the lantern would increase in popularity as a means of exhibiting photographs.

Mr. Sebastian Davis gave an interesting *resumé* of the principal features of the methods ordinarily employed for making photographic lantern slides, with all of which he had experimented. The enormous advantage of the gelatino-bromide process as a means of securing representations of moving objects was referred to; indeed, one may consider that the means of producing the negative are as perfect as may be wished, and it is time for the experimenter to set to work with the view of finding the best methods of producing the transparencies. The collodion process certainly has the advantage of yielding clear whites, and of being thoroughly under control.

The first series, by Mr. Frank Howard, consisted principally of architectural and sylvan subjects, the positives being made by the wet collodion process. The view from Hillsborough Hill at Ilfracombe was remarkable for brilliancy, accompanied with the most perfect gradation of tone in the lighter shades. Lynmouth, including Lynton and the bridge at Lynmouth, form delightful studies; such, indeed, as may make a painter look on the camera with a feeling tinged by envy.

Perhaps the most interesting series was that exhibited by Mr. Raphael Meldola, the pictures having been taken on the eclipse expedition of 1875. The first view showed the members of the expedition on board the P. and O. steamer *Baroda*, including Dr. Vogel, Mr. H. Reynolds, Mr. Beazley, Dr. Schuster, Mr. F. Lott, and Mr. Meldola. The scene then shifted to Camorta, one of the Nicobars, where a small hill had been cleared for the work of the expedition. The unpacking of the apparatus was shown, and also the erected and adjusted instruments, including those brought from Calcutta by the party under Captain (now Major) Waterhouse, and likewise the contingent from Italy under the direction of Professor Tacchini, of Rome. Numerous interesting views illustrative of the island and its inhabitants were also shown, the main peculiarity of the villages being the circumstance that the houses are built on poles, so as to allow the tidal waters to flow underneath them. It is curious to note that the aborigines of the Nicobars, although not having any anthropological affinities to the cultured tribes of India, have certain artistic abilities, and some of the slides showed interesting examples of their wood carvings and painted mats. Various groups of the natives were shown.

Mr. Ray Woods showed several slides illustrating uranium, iron, and copper toning, these being either identical with, or

similar to, those previously exhibited by him in the same room (vol. xxvi., page 261).

Mr. England showed a selection, comprisiug tannin, coffee, collodio-albumen, and wet collodion, the wet collodion slides being, on the whole, the most effective. He also showed a series on gelatino-chloride plates, produced from wet collodion negatives.

The Sciopticon Company (reprcsented by Mr. George Smith) sent some magnificent examples of enlargements from microscopic objects, these having been priuted on glass by the Woodburytype process.

The alpine views of Professor Donkin, some on gelatino-chloride and others on gelatino-bromide plates, were much admired, and they appeared to be free from the veil or fog which often mars gelatine slides.

Mr. Moncrieff's gelatino-bromide slides were excellent as regards colour and gradation of tone; the subject beiug views of well-known localities in North Wales.

Mr. Wellington exhibited slides on gelatino-bromide plates, as exemplifying his method of varying the tone by modifying the exposure and development (see page 142).

Mr. Fincham's wet collodion slides for gelatine negatives were much admired, especially a picture of a water-fall taken near Dolgelly with so short an exposure as to almost depict the spray of the dashing water.

Dr. Huggins sent a few of his well-known stellar spectra, and a very striking photograph showing the total of the sun for 1871.

Mr. Edwards showed albumen plates toned with gold, and also some fine pictures illustrative of life in New Zealand.

The Chairman considered that collodion had held its own very satisfactorily, and he did not anticipate that the newer processes would entirely replace it for a very long time.

The next meeting of the Society will be held on the 22nd inst., and at the following meeting (May 13) a paper will be read by Mr. John Spiller on "The Fading of Prints," and Mr. W. E. Debenham will make a communication on the subject of "Dark Room Illumination."

South London Photographic Society.

The ordinary meeting of this Society was held on Thursday, the 3rd inst., at the House of the Society of Arts, John Street, Adelphi, W.C., the Rev. F. F. Statham, M.A., president, in the chair.

The minutes of the previous meeting having received confirmation,

Mr. A. G. F. Ferrol (Malta) was admitted a member of the Society.

The Chairman, in presenting the Secretary and Treasurer, Mr. F. A. Bridge, the Society's medal, said it was a duty which gave him much pleasure to perform. Its chief value to the recipient was the knowledge that it had been adjudged for the merit of his "View on the River;" but the medal would have a double value to Mr. Bridge from the knowledge that it was given by friends, as well as being adjudged by an artist of the highest standing in the artistic world.

Mr. F. A. Bridge thanked the Chairman for his kind expressions, and mentioned that Mr. Ferrol had become a member in order to compete for the Society's awards. He further stated that at the next meeting a paper on "Composition" would be forthcoming from Mr. Norman Macbeth, of the Edinburgh Royal Academy, and he trusted there would be a full meeting.

The Chairman remarked that such a paper from an artist of high standing must prove of great service to photographers. In photographing views of common objects, such as shipping on the river, they would scarcely expect to get beautiful results in composition—Mr. Bridge had done so. In the Art Journal he noticed a picture of a very commonplace subject (Cannon Street Hotel), which is a thoroughly artistic picture. With proper treatment the most common objects may be artistically treated. The Chairman then called upon Messrs. C. and T. Darker to exhibit some objects in the lantern polariscope.

Mr. C. Darker said they did not propose reading a paper, nor would they presume to teach photographers who knew as much concerning light as they themselves did; but in case any present were not versed in the subject, they would mention the principles involved in polarizing a ray of light. Commencing with the Newtonian theory, the reflecting and transmitting of ordinary light was explained, and how a beam of light falling on a bundle of glass plates at an angle of 57½° would be polarized; the undulations of light at one plane was also mentioned. Using a lantern polariscope and a disc eight feet in diameter, Messrs. Darker projected a large number of objects on the screen. Commencing with tourmaline for stopping light in one direction, a Nicol's prism was shown to act in a similar manner when rotated; their combined use gave the means of analysing light. Passing polarized light through doubly refractive bodies was illustrated, and an example of salycene was shown; it being explained that in splitting up the rays, one set of undulations are retarded more than the other, this being exemplified by a green colour and its complementary, blue, resulting. Another example, Iceland spar, was shown, in which the two colours overlapping each other produced white light. The use of selenite plates was next dealt with, and the difficulty experienced in grinding mentioned. The effect produced by a selenite plate in front of designs of insects, floral, and a cameleon was shown; the numerous changes of colour being very much admired, and in each case the colour was afterwards neutralized. Several different forms of crystallization were next shown, including the formation of crystals of benzoic acid; cross crystallization of quartz (a defect troublesome to opticians) being also shown. Compression and expansion of unannealed glass was next dealt with, and its probable effect on photographic lenses called attention to. Pressure exerted by a screw disturbing the molecular arrangement and causing colour to appear which disappeared on withdrawing pressure; heat was also shown to produce a similar effect. Annealed glass was also treated, some very exquisite designs in colour appearing, the forms of which depended on the external shape of the glass, the points showing an absence of colour through their ability to resist pressure. Convergent light was next dealt with, the uni-axial system in which one cross and set of rings appear, and the bi-axial system, having two centres, was shown; borax and sections of quartz representing the bi-axial and circular systems was introduced, right and left-handed crystallization being explained, including some very fine examples lent for the occasion by Mr. Lewis Wright, who also sent three very beautiful mica designs. From a photographic point of view, the examples of crystallization photographed by ordinary light, also by polarized light by Mr. G. Smith, junr., were most interesting, Mr. Darker dwelling on the multitude of advantages obtained in the case of mineralogical subjects if they were always photographed both ways and thrown on the screen side by side.

The Chairman said it was not necessary to make very extensive remarks in thanking Messrs C. and F. Darker for the interesting and exceedingly beautiful exhibition they had witnessed, and which he knew entailed expensive and elaborate instruments to give them such a treat as they had on that occasion. He did not think photographers were obliged to understand the science of polarized light in order to carry out their undertakings; but there is a desirability for them to give a little attention now and then to its teachings. Practically photographers are under a great obligation to polarized light, and as one of its possible adaptations he would suggest the desirability of testing samples of chemicals by its means. Mr. Darker showed the effect of pressure on glass, which he considered had a most important bearing on photographic lenses. When lenses are fitted too tightly in their cells, and there is an increase in the temperature, it would most likely produce distortion; although under these circumstances no difference may be seen on holding the lens to the light, yet it could be detected by the disarrangement of particles if examined in the polariscope. Annealing was also very important. If a sample of glass imperfectly annealed should by chance be passed, a lens with defects from this cause might find its way on the market. With these few remarks to show the practical bearing of the subject on photographic work he (the Chairman) expressed his thanks most heartily to Messrs. Darker, which was accompanied with the usual vote of thanks from the meeting.

The following from the "Question-Box" was read:—"Does the burnishing of prints produce any chemical change in them?"

Mr. Harrison was not prepared to say any chemical change took place, but he recollected a suggestion to iron prints with a hot flat-iron many years ago. He believed the suggestion emanated from Messrs. Claudet and Houghton.

Mr. E. W. Foxlee said one of the oldest books he possessed on photography recommended ironing prints.

There being no further remarks, the Chairman said he should be glad if the members would make use of their privilege—that is, each bring a friend—so that a good meeting will be assured when Mr. Macbeth reads his paper, which he considered a favour

of a high order. If any member had a subject to bring on after the discussion on Mr. Macbeth's paper, he should like notice of it.

Mr. ASHMAN would be able to show prints from negatives on Morgan and Kidd's bromide paper; at the same time, it was not desirable to have several subjects when an important paper is announced. The discussion on the chemical change in burnished prints had suffered through coming directly after such an interesting subject as Messrs. Darker's.

Mr. F. YORK suggested that a set of Mr. A. Pringle's artistic pictures be thrown on the screen, and a discussion on their artistic merit take place. They would thus get the criticism of an art critic on photographs of the highest class.

The CHAIRMAN thought that had better be a subject for another meeting, as it would not be fair to get the criticism of Mr. Macbeth without first of all mentioning the matter to him.

Mr. YORK showed a camera fitted with a revolving flange or plate for quickly altering the position from the vertical to the horizontal. A description will be found on page 63 of the present volume.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 3rd inst., Mr. W. COLES in the chair.

Mr. J. B. B. WELLINGTON showed a transparency taken by contact on a plate by the cold emulsification process, and gave the formula as follows :—

A.	Nitrate of silver	50 grains
	Citric acid	50 „
	Water...	4 ounces

Ammonia sufficient to re-dissolve the precipitate of citrate of silver.

B.	Potassium bromide	45 grains
	„ iodide	1 grain
	Carbonate of ammonia	30 grains
	Gelatine	10 „
	Water	4 ounces

Add A to B and mix cold; this gives a ruby emulsion which is to stand for twelve hours; at the end of that period warm up, when it will be of blue colour. Then add—

Gelatine	200 grains

When washed, make up to 10 ounces of emulsion. In reply to a question, Mr. Wellington said "the quantity of silver to each half plate would be about 1 grain."

Mr. COWAN had made a batch of boiled emulsion, adding 5 drops of ammonia to each ounce, and at the time found no difference; but after keeping it for a few days, the plates were insensitive in places. He also called attention to the frequent assertion that a blue emulsion was the most rapid. He had come across two commercial plates by the same maker, the colour of one being blue, the other being orange; they were almost of the same rapidity, the advantage, if anything, being in favour of the orange. The density was also nearly identical.

Mr. WELLINGTON showed two enlargments (12 by 10) from lantern transparencies. They were made in the lantern on plates containing about five grains of silver, with a Ross R.S. lens 7½ inches focus, No. 16 stop (universal system), exposure two minutes.

Mr. HENDERSON, referring to a safe light for the dark room, said he had made some experiments by passing the light through glass painted with phosphorescent paint. He found he got a safe light by using three such glasses, and after two or three hours the outside glass was not luminous.

Mr. DEBENHAM: Is the safety due to phosphorescence, or to colour mixed with the paint?

Mr. HENDERSON thought to both, but more especially to the tablet absorbing much of the violet rays; he promised to show the lamp at an early meeting, and also to read a pamphlet on light written by Lord Rayleigh.

Mr. Debenham's lecturette on lenses will be delivered on the 17th inst.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

THE Annual Meeting of this Society was held in Lamb's Hotel on Thursday, 3rd inst., at which there was a good attendance, Mr. W. D. VALENTINE presiding.

Mr. VALENTINE read a letter from Mr. J. C. Cox, expressing his regret at not being able to be present, and thanking the members for their kindness in re-electing him to the Presidentship.

The CHAIRMAN said the Society was fortunate in possessing in their President a gentleman who was an enthusiastic photographer, an acknowledged artist, and of good social position. Mr. Cox had spared neither time nor money in promoting the welfare of the Association ever since its establishment; his latest gift to the Society being a fully-equipped developing room, which is already being largely taken advantage of.

The following new members were admitted :—Messrs. W. W. Moncrieff, D. R. Mitchell, John Jones, D. R. Malcolm.

The election of office-bearers was then proceeded with, and the following is the list for 1884-85 :—

President—Mr. J. C. Cox.

Vice-Presidents—Messrs. W. D. Valentine and D. Ireland.

Council—Messrs. G. D. Macdongald, J. Geddes, H. G. Fraser, A. C. Lamb, Alfred Guthrie, and G. F. Roger.

Hon. Treasurer—Mr. John Robertson.

Hon. Secretary—Mr. D. Ireland, Jun.

Auditors—Messrs. John Moss and John R. Wilson.

A special vote of thanks was passed to the Hon. Secretary and Hon. Treasurer for the efficient manner in which they had fulfilled their duties in the past session.

Mr. G. D. MACDOUGALD then read an able paper on "Development," and gave the particulars of a new developer which yielded negatives of a peculiar rich non-actinic colour, another advantage being that all the ingredients were dry, they only requiring the addition of water to form the developer.

Some discussion took place as to whether the negative was better to be of a blue or of a non-actinic colour. The opinion of the meeting was that the latter was preferable.

Dr. TULLOCH said that a gelatine negative rarely printed quite satisfactorily without after-treatment; and that he was in the habit of applying mercury bichloride, followed by ammonia, to nearly all his negatives. This treatment seemed to bring up the detail in the shadows, while the high-lights, being already opaque, were not affected by it.

The CHAIRMAN was greatly averse to the use of mercury, as he found that negatives thus treated faded in the course of a year or two. On his motion, a vote of thanks was awarded to Mr. Macdougald.

Mr. VALENTINE also showed a negative in which the sunlight on the pillars and wall of the interior of a cathedral was perfectly clear glass, the reversal being caused by over-exposure.

A vote of thanks to the Chairman closed the proceedings.

Results of competition for February portrait taken in a room :—J. Sturrock, 200 marks; Dr. Tulloch, 150. For March competition, "Still Life," there was only one entry, Mr. D. Ireland, Junr., 200 marks.

NORTH STAFFORDSHIRE PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting was held on Wednesday evening, April 2nd, at the Mechanics' Institute, Hanley, Mr. R. S. BURGESS occupying the chair.

Mr. W. F. Fishburn was elected a member of the Society.

The HON. SECRETARY exhibited a half-plate tourist apparatus by Mr. C. E. Elliot, of London. The elegant appearance and finish of the camera were much admired, the excellence of the dark slides being also remarked upon.

A paper upon and demonstration of the process of "Photo-micrography" (see page 229) having been given by Mr. Allison,

A vote of thanks was unanimously passed to that gentleman, and after some interesting conversation upon the subject of photo-micrography, and Mr. Allison had passed round some transparencies upon collodio-bromide, the meeting terminated.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting was held at the Manchester Technical Schools, on March 13th, the President, Mr. JOHN POLLITT, in the chair.

The minutes of the previous meeting were read and confirmed, and the ballot was taken, and the following gentlemen were admitted as members :—Messrs. W. Jenkinson, J. F. Lees, Levi Lambert, H. Pope, and Charles Coote.

Mr. JOS. GREATOREX read an interesting and somewhat amusing paper entitled "A Summer's Holiday," consisting of notes of a recent tour in Switzerland.

Mr. S. D. MCKELLEN gave a practical demonstration of the 'Printing on argentic bromide paper as manufactured by Messrs.

Goodall and Stevens," and also made an enlargement on the same paper, about 12 × 10, from a 3 × 4 negative. The method of enlarging adopted by Mr. McKellen was to illuminate the negative by the aid of a Scioptieon lantern, and he stated that he had found a sheet of ground glass interposed between the negative and condenser a great improvement.

The Hon. Secretary said if the condenser was large enough to cover the negative, the ground glass was unnecessary.

Several prints and enlargements were exhibited by the demonstrator, and admired for their pure whites and general brilliancy.

Votes of thanks were passed to Messrs. Greatorex and McKellen.

The Chairman then referred to the interesting paper read at the last meeting by Mr. Richton, and said, but for the lateness of the hour, he should have invited a discussion on swing-backs and swing-fronts, as he knew there were several members who had studied the subject, and desired to communicate their views. He would, therefore, have great pleasure in bringing the matter forward at the next meeting.

The Hon. Secretary said he should give them a communication, and probably a demonstration in making enlargements from small negatives, at an early date.

An interesting and enjoyable evening terminated at a late hour.

Talk in the Studio.

The Twenty-fifth Anniversary of the South London Photographic Society.—On Saturday, May 10th, a dinner will take place at the Holborn Restaurant, to celebrate the prosperous existence of the South London Society during a quarter of a century, and the Rev. F. F. Statham, who has presided over the Association during the whole of the period, is to be the honored guest of the evening. The first meeting of the Society took place on May 10th, 1859, and a report will be found on page 117 of the Photographic News for the year in question. Any persons who may wish to be present at the dinner, or who may desire to otherwise assist in the commemoration, should communicate with the Hon. Secretary, Mr. F. A. Bridge, 9, Norfolk Road, Dalston Lane, London, E.

Behaviour of Silver Chloride, Bromide, and Iodide with Bromine and Iodine.—By P. Julius (*Chem. News*, 48, 284).—By passing dry air saturated with bromine over silver iodide kept in a state of fusion, the iodide is easily and completely converted into bromide after ten minutes. In the same manner silver chloride can be converted into bromide in one or two hours. Further experiments prove that both chlorine and bromine may be expelled from their silver compounds by means of iodine vapour, although six to ten hours are required to effect this change with the chloride. Hence any halogen, if supplied in excess, can expel any other halogen from its combination with silver; at least, as far as chlorine, bromine, and iodine are concerned.—*Journal of the Chemical Society.*

Absolute Total Actinometer.—M. G. A. Hahn.—The author's apparatus consists substantially of a retort exposed to the sun, and connected with a condenser and receiver placed in the shade, but in the open air. Carbon disulphide is poured into the retort, and a vacuum is made in the apparatus so that it may contain merely the vapour given off by the liquid. As long as the sky is overcast, the liquid remains in the retort without distillation or condensation. As soon as the sun shines, the carbon disulphide begins to boil, and the liquid collected in a receiver in an unit of time is proportional to the quantity of solar heat received in the same time.—*Chemical News.* ["Total Actinometer" is not used quite in the sense in which a photographer would understand it. The instrument in question measures, after a fashion, the total radiation; not merely the chemical rays.]

The Lantern Exhibition of the Field Club.—This was held at the room of the Society of Arts, on Tuesday evening, and the honours of the occasion were carried off by Mr. Joseph Gale. Exhibits by Mr. Trueman Wood, Mr. Whiting, and others, were much admired.

Re-sittings.—For the sake of peace and quietness we will admit that the photographer is a much-abused individual, and that it *is* hard—dreadfully hard—to have to re-sit a person when the negative is chemically perfect, and is fit for a specimen. But, see here, brother photographer, what are you working for, anyhow? Money! We thought as much. Now, it seems to us that although it is very disheartening to have to give a patron a re-sitting when the first negative is good chemically, that it is killing the goose that lays the golden eggs to ride the high-horse and refuse to comply. Suppose you are getting out a circular to advertise your business, don't you want a proof to see if it meets your views? And supposing it doesn't, do you take it? Not by a jugfull. You are going to have that circular to your mind, or—go somewhere else. And in the matter of one's own face—great Cæsar! the victim is bound to have a voice in the matter. Vanity, dear sirs, vanity sticks closer to the bones than beauty. Of course you can refuse to give a re-sitting; that is the noble prerogative of every photographer. But the satisfaction is short-lived when the sitter goes elsewhere, and tells everybody that he threw your pictures into the fire. Change of dress should mean additional charge, but if the expression is not right, and the pencil cannot make it right, then—sit them again. Everything, humanly speaking, rests with the one who shows the sitter the proof. A good reception-room hand is worth her weight in gold—a bad one is ruination. A sitter, male or female, old or young, rich or poor, is tractable enough if properly handled. But there must be no hesitation—no doubt about what can or what cannot done in the way of improvement. It would, however, be well for photographer to bear this in mind, that pictures that pay are made to please the sitter, not to fill the showcase, and [illegible]etter to gain one true friend than to make a hundred good-fo[illegible]ning enemies. —*Walzl's Monthly.*

Antidote to Iodine.—A case of poisoning by iodine has come forward in Germany, and forms the subject of an article in the *Apotheker Zeitung*. The outcome of the whole affair is that this really dangerous case was combated by the administration of hyposulphite of soda. This salt, which is largely used by photographers, and has recently been resorted to in medicine as a valuable febrifuge, is not poisonous, and can be administered in solution in water, in which it is readily soluble. In cases of poisoning by iodine, when the stomach is in a state of irritation, it appears to bring on vomiting, which carries off a good deal of the poison. The journal quoted says that when this has occurred the ordinary antidote of iodine—namely, starch paste—may be administered; but it strikes us that the hyposulphite solution is a more active antidote than starch paste, as it would finally transform the free iodine into iodide of sodium, which is comparatively harmless, whilst the compound of starch and iodine appears to be only a mechanical mixture, or at least not a definite chemical combination.—*Burgoyne's Magazine.*

Photographic Club.—At the next meeting, on April 16th, the subject for discussion will be "On packing and re-packing dry plates when on a tour." On April 14th (Bank Holiday) an out-door meeting has been decided upon. Members and friends desirous of joining may ascertain particulars by application to the Hon. Secretary.

To Correspondents.

*** We cannot undertake to return rejected communications.

S. Nicholls.—It is not possible to conceive a more thorough method of washing the prints than that which you propose. We should advise that a cage made of cane or basket work would be better than a wooden box. It should be turned round on its vertical axis a few times during the period.

Edgar.—(*a*) It was made by pressing thick blotting-paper against a metal block which had been grained by means of a planing-machine. (*b*) We do not know, and we hardly think he would tell you if you asked him.

G. C. R.—The potash appears to have acted unequally on the fabric, and we would advise a longer boiling in a weaker solution.

Neophyte.—The "A B C of Photography," by Burton. It is published at our office.

Phaide.—For white, use the so-called permanent white, and alizarine lake for red. Raw or burnt sienna may also be depended on. Crimson lake and carmine are among the most fugitive of pigments.

S. C. Riley.—You are quite right; a film is not wanted. The method usually adopted in London is to make a photo-lithographic transfer, and to put it down on the block by pressure; but when the fatty transfer is once made, it is generally more convenient to put down on zinc and to etch into relief, unless the alterations required are very extensive. The same remark applies to transfers in grain or stipple. A method which gives a thin and perfect half-tone picture without any film is most suitable.

H. W. O.—During the life of the author and seven years afterwards.

HANDTYPE.—The best method is the ordinary phototype or zinc-etching method. See a series of articles on Chemigraphic Engraving which appeared in the PHOTOGRAPHIC NEWS during 1882. The first of the series is on page 673.

W.—It is probable that the mischief arises rather in connection with the camera than with the plate. Examine carefully for any projection which can shade the lower part of the plate, any crevice which may allow extraneous light to enter, or any smooth surface which is likely to reflect light.

ARCHER.—It will hardly prove a serviceable instrument in comparison with the objectives manufactured now-a-days, but many persons would value it as a curiosity. The space between the lenses must be filled with water.

J. E. H.—We will see what particulars we can gather by next week.

E. GRANT.—1. Considering that dissatisfaction was only expressed on account of the dresses, you should insist on full payment for all the pictures. 2. A fair charge for each cabinet negative would be one-half of your usual charge for a cabinet negative and six prints.

A KNOTTY POINT.—1. If copies have been sold, it is too late to secure the copyright. When a picture is made to the order of a customer, the copyright belongs to the customer. 2. It is sufficient to secure the copyright of the original photograph, as this will cover all reproductions by wood-engraving or other methods. 3. Our Publishers attend to the formalities of registration for a fee of 1s. 6d. for each picture.

H. CRUTCHLEY.—1. You certainly would act very indiscreetly if you were to use an ordinary commercial adhesive of unknown composition for mounting your pictures. 2. It appears to us as if the friction edge of the burnisher were rough, or as if some circumstance had caused the iron to bite into the face of the print. Re-face the burnisher on a good oilstone, and use a little encaustic paste (see Formulary)

SPOTS.—Cases have occurred in which mounts have contained soluble ferric salts, as, for example, the perchloride of iron, or the persulphate. Either of them will act on the silver image, and destroy it; the rapidity of the action depending on the proportion of the injurious salt present. When soluble salts of iron are present, they appear to have been used in compounding the colouring material used for tinting the mounts; and perfectly white cardboard may be relied upon as free from all deleterious salts of iron.

NITRATE.—It is not sufficiently soluble for the purpose, but by acidifying the solution with acetic acid, you will perhaps overcome the difficulty. If, however, you will explain the nature of your experiments in greater detail, we may be able to give you more definite advice.

GEORGE PRINCE.—We cannot tell you; and if, as you say, you have the complete set of volumes, it is as easy for you to make the search as for us to make it. 2. They have little or no market value.

Price 6d., by post 6½d.

A TRIP TO THE GREAT SAHARA WITH A CAMERA. BY A COCKNEY. Being an Account of a Month's Winter Holiday, with Diary of Journey and Statement of Expenses.—PIPER & CARTER, PHOTOGRAPHIC NEWS Office, 5, Castle Street, Holborn, E.C.

The Photographic News Registry.

Employment Wanted.

Youth, to learn photography.—D. L., Pliny Villa, Godwin-rd., Forest-Gate.
Operator & Retoucher, 30s.—A. B., 21, Bethel-st., Norwich.
Operator & Retoucher (Italian).—Dal-Mistro, 64, Frith-st, Soho.
As Improver in first-class house.—W. T., P. O., Stretford, Manchester.
Gen. Assist. (21). Lond.—G. P., 6, Kensington-pk.-rd., Notting-hill-gate.
Assist. Op. & Printer in Lond.—L. W. Green, Dennett's-rd., Peckham.
Photographer of exp., free April 28.—W. F. Anderson, 5, Tarvit-st., Edinb.
Recep.-Room (Lady), gen. useful.—A. M., 28, Atlantic-rd., Brixton.
Printer & Toner, Frenchman.—A. B., 6, St. Margaret's-st, Leicester-sq.
Retoucher & Assist. in Recep.-Room.—Miss J., 10, Edith-rd., Peckham.
Operator & Retoucher, well up in mono.—Photo. Artist. 54, Warren-st., W.
Recep.-Room, finish. mount, books, &c.—A. B., 1, Prior-st., Greenwich.
Op. & Ret., understands Fch., Ital., English.—A. B., *Photo. News* Office.
Recep.-Room, &c, at 18/- for permanency.—E. H. H., *Photo. News* Office.
Retoucher, can tint.—Miss Cross, Hill-st., Peckham.
Operator, can retouch, enlarge, print, manage.—X., 115, High-st, N.W.
Printer or Gen. Assist.—J. A. Randall, The Bazaar, Broadstairs, Kent.
Retoucher, Artist, &c.—W. Rubens, 28, Pond pl, S. Kensington.

Employment Offered.

Youth, to develop & be useful in studio.—S. S., 55, Moorgate-st.
Assist. Operator for landscape.—Norman and Co, Tunbridge Wells
Operator, to retouch.—T. Moss, 199, Derby-st., Bolton, Lancs.
Oper., clever with children & retouching.—Clayton, 6, Lond.-rd., Leicester.
Retoucher, to operate in principal's absence.—Reed, 16, Tottenham-ct.-rd.
Printer, Toner, Mounter, Burnisher.—Shrubsole, Davey-pl., Norwich.
Operator, good, at once.—C. K., 96, Bath-st., Glasgow.
Printer, first-class, immediately.—Hills & Saunders, Aldershot.
Recep.-Room Lady for Brighton.—C. H., Clermont, Preston-pk., Brighton.
Operator, who can retouch, for month.—Norman May, Malvern.

THE EVERY-DAY FORMULARY.

THE GELATINO-BROMIDE PROCESS.

Emulsion.—A—Nit. silver 100 grains, dist. water 2 oz. B—Bromide potassium 85 grains, Nelson's No. 1 gelatine 20 grains, dist. water 1½ oz., a one per cent. mixture of hydrochloric acid and water 50 minims. C—Iodide potassium 8 grains, dist. water ½ oz. D—Hard gelatine 120 grains, water several oz. When the gelatine is thoroughly soaked, let all possible water be poured off D. A and B are now heated to about 120° Fahr., after which B is gradually added to A with constant agitation; C is then added. Heat in water bath for half an hour, and stir in D. After washing add ¾ oz. alcohol.

Pyro. Developer.—No. 1—Strong liq. ammonia 1½ oz., bromide potassium 240 grains, water 80 oz. No. 2—Pyro. 30 grains, water 10 oz. In case of an ordinary exposure mix equal vol.

Iron Developer.—Potassium oxalate sol. (1 and 4) 80 parts, ferrous sulphate sol. (1 and 4) 20 parts, dist. water 20 parts. To each 4 oz. of the mixed developer add from 5 to 30 drops ten per cent. sol. potassium bromide, and 30 drops sol. sodium hyposulphite (1 and 200).

Substratum or Preliminary Preparation.—Soluble silicate of soda 1 part, white of egg 5 parts, water 60 parts. Beat to froth and filter.

Fixing.—Sat. sol. of sod. hypo. 1 pint, sat. sol. of alum 2 pints, mixed.

Cowell's Clearing Solution.—Alum 1 part, citric acid 2 parts, water 10 parts. Edwards makes this sherry coloured with perchloride iron.

Eder's Method of Intensification.—The negative is whitened by soaking in sat. sol. of mercuric chloride, and after thorough rinsing immersed in potass. cyan. 10 parts, potass. iod. 5 parts, mercuric chloride 5 parts, water 2,000 parts. As film becomes dark brown, the actinic opacity is increased; but prolonged action causes brown tint to become lighter, until at last the negative is no denser than at first.

Fol's Backing Sheets.—A chromographic paste is prepared with gelatine 1 part, water 2 parts, glycerine 1 part, and a very small addition of Indian ink. Strong paper or shirting is coated, and the sheets are laid, face downward, on waxed glass to set. Press to back of glass plate.

THE WET COLLODION PROCESS.

The Nitrate Bath.—Water 14 oz., nit. silver 1 oz., nitric acid 1 drop. Before using coat a small plate, and immerse it for 20 minutes.

Cleaning Preparation for New Plates.—Alcohol 4 oz., Jeweller's rouge ¼-oz., liquid ammonia ½-oz.

Film-removing Pickle for Old Plates.—Water 1 pint, sulphuric acid 4 fluid oz., bichromate potassium 4 oz.

Substratum.—Whites of 2 eggs well beaten, 6 pints of water, and 1 dr. liq. ammon.

Negative Collodion for Iron Development.—Alcohol 1 pint, pyroxyline of suitable quality 250 grains, shake well and add ether 2 pints, *Iodize this by mixing with* one-third of its volume of alcohol ½ pint, iod. ammon. 80 grains, iod. cadm. 80 grains, brom. ammon. 40 grains.

Normal Iron Developer.—Water 10 oz., proto-sulphate iron ½ oz., glacial acetic acid ½ oz., alcohol ¾ oz. The amount of proto-sulphate iron may be diminished to ¼ oz. when full contrasts are desired, or increased to 1 oz. when contrasts are unduly marked. With new bath quantity of alcohol may be reduced to ¼ oz.; but when bath is old more is wanted.

Intensifying Solution.—Water 6 oz., citric acid 75 grains, pyro. 30 grains. When used, add a few drops of the silver bath to each ounce.

Lead Intensification.—After neg. washing, immerse in dist. water 100 parts, red pruss. potash 6 parts, and nit. lead 4 parts. When it is yellowish white wash and immerse in liquid sulphide ammon. 1 part, water 4 parts.

Fixing Solution.—1. Potass. cyanide 200 grains, water 10 oz. 2. Sat. sol. of sod. hypo.

Varnish.—Shellac 2 oz., sandarac 2 oz., Canada balsam 1 dr., oil of lavender 1 oz., alcohol 16 oz.

PRINTING PROCESSES.

Albumen Mixture for Paper.—White of egg 18 oz., 500 grs. ammon. chlor. in 2 oz. of water. Beat to a froth, stand, and filter.

Sensitizing Solution.—Nit. silver 50 grs., water 1 oz., sod. carb. ½ gr.

Acetate Toning Bath.—Chl. gold 1 gr., acet. soda 20 grs., water 8 oz.

Lime do.—Chl. gold 1 gr., whiting 30 grs., boiling water 8 oz., sat. sol. chl. lime 1 drop. Filter cold.

Bicarbonate do.—Chl. gold 1 gr., bicarb. soda 3 grs., water 8 oz.

Fixing Bath.—Sodium hypo. 4 oz., water 1 pint, liq. ammon. 30 drops.

Reducer for Deep Prints.—Cyan. potass. 5 grs., liq. ammon. 5 drops, water 1 pint.

Encaustic Paste.—Best white wax 1 oz., oil of turpentine 5 oz.

Sensitizing Bath for Carbon Tissue.—Bichromate potash 1½ oz., water 30 oz., ammonia 1 dr., methylated spirit 4 oz.

Enamel Collodion.—Tough pyroxyline 120 grs., methylated alcohol 10 oz., ether 10 oz., castor oil 20 drops.

Mountant.—1. Fresh solution of best white gum. 2. Fresh starch.

Collotypic Substratum.—Soluble glass 3 parts, white of egg 7 parts, water 10 parts.

Collotypic Sensitive Coating.—Bichromate potash ½ oz., gelatine 2½ oz., water 22 oz.

Collotypic Etching Fluid.—Glycerine 150 parts, ammonia 50 parts, saltpetre 5 parts, water 25 parts.

Printing on Fabric.—Remove all dressing from fabric by boiling in water containing a little potash, dry, and albumenize with ammonium chloride 2 grammes, water 250 cubic cents., and the white of 2 eggs, all being well beaten together. A 70-grain silver bath is used, and the remaining operations are as for paper.

Cyanotype Printing.—Water 1 oz., red prussiate of potash (ferricyanide) 1 dr., ammonio citrate of iron 1 dr. Prepare and preserve in the dark. Float the paper and dry. Fixation by mere soaking in water.

VARIOUS.

Luckardt's Retouching Varnish.—Alcohol 300 parts, sandarac 50 parts, camphor 5 parts, castor oil 10 parts, Venice turpentine 5 parts.

Matt Varnish.—Sandarac 18 parts, mastic 4 parts, ether 200 parts, benzole 80 to 100 parts.

Encaustic Paste.—Best white wax, in shreds, 1 oz, turpentine 5 oz.; dissolve in gentle heat, and apply cold with piece of flannel.

FERROTYPES.

Collodion.—Ammonium iodide 35 grains, cadmium iodide 25 grains cadmium bromide 20 grains, pyroxyline 70 grains, alcohol 5 oz., ether 5 oz.

Bath. Silver nitrate 1 oz., water 10 oz., nitric acid 1 drop.

Developer.—Ferrous sulphate 1 oz., glac. acetic acid 1 oz., water 16 oz.

Fixing and Varnish.—Same as wet collodion process.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

DROPS OF LIQUID.

PHOTOGRAPHERS so often employ liquids in the form of drops that some experiments recently made by M. Boymond, to get at the weight and volume of certain drops, must have an interest for them. We all of us know that drops vary very much in size, and we can guess, if we do not know, that drops of water and drops of alcohol are of different weight. Nevertheless, it is very usual among photographers to regard a minim as made up of a fixed number of drops, no matter how these drops are formed, or of what liquid they consist. Now M. Boymond tells us some very interesting points on the forming of drops, and has tabulated the weight of such liquids as are most in use in chemical and other manipulations.

In the first place, M. Boymond reminds us that the weight of a drop depends upon the *exterior* diameter of the tube from which the liquid falls, and not upon the *interior* dimensions, the latter having only an influence upon the rapidity with which the liquids flow.

Next, the nature of the liquid (water, alcohol, ether, chloroform, acetic acid) alone influences the weight of a drop, no matter what proportion of soluble matter it may contain.

Thirdly, to obtain drops of distilled water, going twenty to a gramme (temperature 15° C.) it is necessary to have a dropping-tube with an *exterior* diameter measuring exactly three millimetres.

Using this three-millimetre tube, M. Boymond has established the weight of drops of various liquids as under :—

One gramme of		
Distilled water	equal to	20 drops
Alcohol of 90°	,,	61 ,,
,, of 60°	,,	52 ,,
Alcoholic tincture with alcohol of 60°	,,	53 ,,
,, of 80°	,,	57 ,,
,, of 90°	,,	61 ,,
An ethereal tincture	,,	82 ,,
A fatty oil (variable) about		48 ,,
A volatile oil (variable) about		50 ,,
An aqueous solution, diluted or saturated		20 ,,
A wine (variable according to amount of alcohol)		33 to 35 ,,
Laudanum (variable) about		33 to 35 ,,

JUSTICE GROVE ON PATENTS.

MR. JUSTICE GROVE, who laboured among the pioneers of photography, and who, if not the first to produce a printing surface by the etching of a Daguerreotype plate, was at least among the first to effect this, has, in the case of Neilson *v.* Rosenthal, made some highly pertinent remarks upon the patent question ; and if those readers who contemplate taking out patents in relation to photography will study what Mr. Justice Grove has to say, we may hope that in the future our patent columns will record fewer claims for processes and methods which have long been in use and are well known, and fewer specifications intended to conceal and mislead. Mr. Justice Grove said :—

Originally the Crown granted monopolies, and could grant monopolies for almost anything it liked. The Crown granted monopolies on salt, sugar, or anything else, excluding other persons from that monopoly ; but in the reign of James II. a statute was passed, which remains law to this day, declaring that monopolies should be abolished ; or rather it declared that they were contrary to the laws of the realm, except Letters Patent granted to the true and first inventor of any manner of new manufacture (I am quoting from memory, and if I am not right counsel will correct me, for I do not happen to have the statute before me), which others could not have used ; that is to say, a person should be allowed to have a monopoly to preclude other persons from using for fourteen years (which was the term originally given, but it is not material how long at present, because this is within fourteen years), any manner of new manufacture, except the true and first inventor. Therefore, the invention must be new. It must not have been used before, and it must be an invention of a manufacture. An invention of an idea or mathematical principle alone, mathematical *formulæ*, or anything of that sort, could not be the subject of a patent. For instance, supposing a person discovered that three angles of a triangle are equal to two right angles, that is an abstract discovery, and would not be the subject of a patent. It must be a manufacture, and it must be a manufacture which must be new in this realm. Shortly afterwards, it was found necessary for the protection of the public that the Patentee should enrol a specification, and in that he was required to describe the nature of his invention, in order that the rest of the public might know what his invention really is, so that they may not unintentionally infringe it, and so that they may know what they are prohibited from using without his leave or licence. He must also describe the means of performing his invention, in order that when his patent expires, people may know how to make it. Letters Patent are, in fact, granted to a person, so to speak, upon the condition that he enrols a specification in which he states truly the nature of his invention and the means of performing it.

Otherwise a patentee might do this: first of all, he might say nothing about the nature of his invention, and he might simply describe the thing he makes, *e.g.*, "This stay is my patent," and than the public might say, "In this stay there is a good deal that is old as well as something that may be new ; the cloth is old, the whalebone is old, the direction of the whalebone or the direction of the cloth is old, and the gores are old," and therefore the public would not know, unless he specified it, what the patentee claimed to be his invention, and the public would not know whether they were infringing or not when they made other sets of stays. They might know that he did not claim the gores, for instance, but when they made a gore, they might be infringing his patent. Therefore, he is bound to state in what the nature of his

invention consists. Then he is also bound so to describe it in his specification as that any workman acquainted with the subject, being a practical workman, would know how to make it; and the reason of that is this, that if he did not do so, when the patent expired he might have some trade mystery which people would not be able actually to use in accordance with his invention (although they had a right to use it after his invention had expired), because they would not know how to make it. That would not apply to a thing of this sort, but to some things it might apply. Therefore he is bound to do these two things—namely, to tell the public what is the nature of his invention, and to tell them how the invention is to be made in practice. Take, for instance, a chemical invention. A man might make a chemical discovery, and he might claim a patent for it, and call it by his own name, "Thomas's this" or "Thomas's that"; and when the patent came to an end, the public might not know the least in the world how to make it, and he would still continue by that means to have a monopoly which he had no right to continue, and which was granted to him for 14 years only, unless it was prolonged, and then, when the 14 years were at an end, the public might not know how his chemical invention is made. It might be a particular sort of varnish. He might make the varnish and sell it for 14 years, and not tell the public how it was made, and then he might get not only 14 years, but twice or three times 14 years' monopoly by keeping secret his manufacture. Therefore, in the interest of the public, the law says the Patentee must fairly and properly describe the nature of his invention in what is now publicly called his claim, and also the means or mode by which it can be performed.

A patented invention must have some utility beyond that which, with regard to a particular thing, has been known before. If it has any utility beyond that, the patent is good; if it has not any such utility—that is, if it is not a bit better than anything that went before—then the patent is bad.

That brings me to another matter which is very important, and which you should have in your mind—namely, that it is not necessary to the infringement of a patent to infringe the whole of it. There may be some patents of which it would be difficult to infringe any part without infringing the whole of it. The claim may be that the entire thing is a novelty. It is difficult to suppose such patents in the present day, because, generally, patents are for only one or two particular improvements in detail. But it may theoretically be so, and in such a case a man infringes if he infringes a substantial or material part of a patent, provided the Patentee in his specification makes it manifest that that part is material. Then again, if that material part which he has infringed existed before the patent, the patent is bad, because the Patentee has claimed that as being his invention, and as having a right to preclude others from using that which others have a full right to use. His patent is bad if he has claimed that which he has no right to claim. In applying your minds to this case, you will apply the same rule to the question of infringement that you do to the question of novelty. I will explain what I mean by that. The Patentees use the word "substantially" in their claim thus: "in an oblique direction substantially as and for the purpose hereinbefore described." That word, to my mind, is an utterly and entirely useless word, because the law gives it him without using it. The law says, if a man, although not literally infringing the letter of the patent, yet substantially infringes it, it is an infringement. But then you must apply the same words to the novelty. You must not tie it down on one side, if I may use the expression, and enlarge it for the other. For instance, take this illustration. If the Patentee's patent is intended to be for seams straight in themselves, placed vertically with regard to the perpendicular of the body, a man who uses the straight seams will infringe the patent. But then, supposing a man uses a seam slightly curved. If that is substantially the same thing, then the man infringes the patent, although the seam he uses is not quite straight, but is nearly straight, because he would "substantially" infringe the patent. But then you must apply the same rules to the alleged anticipation. If the Patentees have a right to claim, as substantially their invention, slightly curved lines, then slightly curved lines made and used before this patent would be an anticipation of the invention. They cannot have it both ways. They cannot claim the benefit of the word "substantially" in support of their invention, and ignore the word "substantially" in respect of anticipations of their invention. You must administer the same measure, so to speak, to both. If the Patentees say, "Our invention is nominally a straight line" (we cannot have an absolutely straight line in practice), "and, therefore, if a man curves it a little he infringes our invention," then they are met with this answer: "If you claim to that extent, and say your invention is either for straight lines or for lines which have a small degree of curvature, and it is proved that small degree of curvature has been used before, then the small degree of curvature is as much an anticipation of the invention as a straight line." You must apply the same rule to both. A Patentee cannot claim for his patent the privilege of a different construction of the same word. If a man claims a curved line, and if it can be shown that that curved line has been used before, his invention is bad. He cannot have it both ways.

It would be interesting to consider what proportion of photographic patents would stand if measured by the rigorous, but strictly just, rules of Mr. Justice Grove; but it is to be regretted that in the trial of patent actions, it rarely happens that the judge is actually competent to deal with the complex technical points raised. But let us hope that the new patent law will inaugurate a period when some effort will be made to have patent cases tried before judges whose training and education have fitted them to deal with them.

STOKES ON LIGHT.

PROFESSOR G. G. STOKES publishes, through Messrs. Macmillan and Co., the first of three volumes on light. This first volume which is now announced treats of the *Nature of Light*, and from it are extracted the following, relative to the two theories of light, viz., the emission and undulatory theories.

"*Primâ facie* there is much to be said in favour of the theory of emission. It lends itself at once to the explanation of the rectilinear propagation of light, and the existence of rays and shadows. It falls in at once with the law of aberration. The laws of reflection and refraction admit of an easy explanation in accordance with it; at least if we accept the existence of both reflection and refraction; for according to this theory we should have expected beforehand that light would have been either reflected or refracted, according to circumstances, not that incident light should have been divided into a portion reflected and a portion refracted.

"The theory of undulations, on the other hand, presents at the outset considerable difficulties. In the first place it requires us to suppose that the interplanetary and interstellar spaces are not, strictly speaking, a vacuum, but a plenum; that though destitute of ponderable matter they are filled with a substance of some kind, constituting what we call a medium, or vehicle of transmission of the supposed undulations. When I speak of this medium as a substance, or as material, I mean that it must possess that distinctive property of matter, inertia; that is to say, a finite time must be required to generate in a finite portion of it a finite velocity."

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"The necessity of assuming the existence of some kind of substance in what we commonly speak of as a vacuum does not appear to have been a serious preliminary difficulty in the way of the reception of the theory of undulations. A far more formidable difficulty appeared at first to be presented by the existence of rays and shadows. It was this that led Newton to adopt the theory of emission, though even he was led in the course of his researches on light to suppose that there was some sort of medium through which the particles of light moved, and in which they were capable in certain cases of exciting a sort of undulation. But the supposition of particles darted forth seemed to him necessary to account for shadows."

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"There is no difference of explanation as regards light and as regards sound, save what depends on the difference of scale entailed by the difference of wave-length. Take as regards light the case of a small circular hole, say the tenth of an inch in diameter, and of distances from the luminous point to the screen in which the hole is pierced, and from that again to the screen on which the light is received, of say 8 feet 4 inches, or 100 inches, each. In this case, regarding the luminous patch on the screen as a whole, there would be no great diffusion of light, but the phenomena of diffraction would nevertheless be fairly pronounced. There ought to be a corresponding case of diffraction for sound; but on what scale? Take 50 inches as the length of a wave of

sound, which would correspond to a musical note of moderate pitch. Taking $\frac{1}{50000}$ part of an inch as the wave-length for light, the length of the wave of sound will be two-and-a-half million times as great as the wave-length of light. Consequently, to obtain the corresponding case of diffraction for sound, our 'small' circular hole would be obliged to have a diameter of rather more than four miles, say four miles, and the distance from the source of sound to the hole through which it passes, and from that, again, to the place where the sound is listened to, would have to be 4,000 miles each.

"It is remarkable that the existence of rays, which formed the great stumbling-block in the way of the early reception of the theory of undulations, is now shown to belong to a class of phenomena, those of diffraction, the complete and marvellously simple explanation of which afforded by the theory of undulations now forms one of the great strongholds of that theory."

The second of Dr. Stokes' volumes will deal with "Researches in which light has been used as a means of investigation," in which we may expect a reference to photography; and the third will treat of "Light considered in relation to its beneficial effects."

By-the-Bye.

PROVINCIAL EXHIBITIONS.

The past few years have abounded in exhibitions. In the north, in the west, and in the midlands, exhibitions have followed one another thick and fast, and photographers no longer grumble at the expense of framing pictures which are to be shown all round the country. Certainly, photographic societies which have the welfare of their members at heart, no less than the progress of photography itself, can do no better than foster these periodical gatherings, for the best demonstration, after all, of advancement in the art is afforded by a display of the pictures that are produced year after year. The members benefit, because they have placed before them, side by side with their own work, some of the best productions of their brethren from afar; while the progress of photography is served by the fact that the producers of good pictures are thus afforded more ample means of showing these to the public. As photography suffers much from lack of publishers to put before the world pictures of merit, these exhibitions of photographs all over the kingdom are, in the absence of such publishers, the best way to make new pictures known.

Photographers, therefore, have much to be grateful for to the societies of our big towns which foster undertakings of this sort. The pictures framed for the London Exhibitions—for the collections in provincial towns are for the most part made up of photographs from Pall Mall—are forwarded subsequently to various parts of the kingdom, and thus the exhibitor, no less than the local visitor, gains by the arrangement. Nay, there may possibly be some who would not go to the expense of mounting prints to be shown only in London, and take into consideration the fact that the frames can be sent elsewhere afterwards, before committing themselves to an outlay; so that the provincial exhibitions also aid that of London indirectly.

Again, there is this good to be derived from the gatherings of provincial Societies, when these give away medals; they serve to equalise and "trim" any doubtful awards, and to emphasise awards which may be thought to be doubtful. To take a recent example of the latter kind. Mr. West, of Gosport, secured a medal in Pall Mall for his frame of yachts. Were these really worth a medal, or had the London jury erred on the side of good-nature in making the award? This was the question that arose afterwards. But Newcastle-on-Tyne and Bristol at once disposed of the matter satisfactorily by definitely clinching the previous judgment.

In the case of pictures which are not honoured in London, but which earn distinction in the provinces, there is, as a rule, equal cause for satisfaction. Not only are judges only men, and, as such, liable to err, but they are sometimes men ill-fitted to be judges; men who act to the best of their ability, who are honest, straightforward, and just, and yet make woeful mistakes by reason of their lack of experience and acumen.

The judges of provincial exhibitions are not influenced by the verdict of the London judges, or, if they are, the influence is rather to reverse that verdict. We mean that a sort of induction arises, positive approval inducing negative approval, and negative, again, positive. There is not much harm in this, and perhaps in the end it leads to a more uniform distribution of awards. In any case, as we cannot expect perfection in the bestowal of honours, we thus get a sort of give-and-take arrangement, which, probably, is the best that can be effected.

In readjusting the balance of awards, then, and in exhibiting to their members and the public generally the best pictures produced in this country and abroad, our provincial societies do a vast amount of good; and we hope, now that we have duly acknowledged the obligation, we may be permitted to speak without offence on two points in connection with certain exhibitions out of London that have scarcely received due recognition. The first is in respect to refusing awards to old pictures. Of course no Society is likely to give medal after medal to the same picture every year, and it is an unwritten law, indeed, in exhibitions, that the same work cannot be exhibited twice. But it is to the interest of a Provincial Society to secure the best collection possible, and, with this end in view, invitations are sent out broadcast to photographers to forward pictures. Now, unless the age of contributions is distinctly mentioned, it is but natural in these circumstances for a photographer to send in the best things he has ever produced, provided always they have not been exhibited before in that locality. In fact, the Society and the photographer are generally at one in the matter so far, for the former is always desirous of including in its collection popular and attractive pictures that have been so well spoken of and so justly honoured in other parts of the country. As regards the exhibiting of the pictures, then, both parties are content, and it is only when the awards begin to be talked about that any difficulty arises. Shall Mr. Sunshine have a medal for his well-known picture, "Butter for Breakfast," or Mr. Shadow receive a prize for that "Breaking Morn" study he did years ago? Both productions are exceedingly meritorious, no doubt, but they are almost as old as the hills, and have been hawked round the country to every exhibition to get a medal for their owners. It is surely high time that something fresher and newer should receive the honours, argue the judges, and "Butter for Breakfast" and "Breaking Morn" are consequently left out in the cold.

"And a good job, too!" will be the general exclamation, in which we are sorely tempted to join. Only, is such a course fair? If Mr. Sunshine and Mr. Shadow have been tempted to send their work by a circular in which nothing is said of old pictures, and if their respective pictures are, despite the date of production, still the best things in the Exhibition, and new to that locality, these gentlemen are surely entitled to the honours. It will not do for hanging committee or judge to take upon themselves to say that age has excluded a picture when no proviso of this nature appears upon the programme. If the officers of a Society are willing to accept such pictures into their collection because the prints are attractive and the Society is ready to absorb the credit which such pictures bring to their collection, then there should be no hesitation about letting these works have medals, if it is their due. Old pictures, even if not previously exhibited, can easily be excluded from an exhibition, by putting a line in the programme to that effect, and it is unfortunate this is not done if old pictures are to be denied honours.

And this first point leads us to the second, which is

equally important, viz., the classification of pictures for medals. The judges nominated by a Society are supposed to act free and independently, and so, doubtless, they do, directly they begin their work. But it may happen that their action, free and independent as it is, runs up and down a groove already made for them. For instance, it may happen that a medal is to be given for landscapes, and the judges, therefore, begin by looking over the landscapes. To facilitate the work, the landscapes have all been hung together, so the judges have nought to do but confine their attention to a section of the pictures. But who has hung the landscapes together, and pronounced upon the all-important question, what is a landscape and what is not a landscape? The person or persons who have done this have a lot to answer for in making the award; for although a resolute member of the jury may look about him a bit, he is hardly likely to influence the judgment. There is a foreshore with a boat and the crisp waves beyond; why is not that among the landscapes? Because, is the answer given, it has been considered a sea-study, or to come under the heading of instantaneous work. But who is it who takes upon himself to say it shall only come under the heading of instantaneous work? It is true there is water in the picture, and it has been secured with a drop shutter, but it is none the less a landscape. Instances of this kind might be repeated indefinitely.

Some time ago we spoke about the absurdity of throwing every picture in which figures found a place, out of the category of landscapes, as if painters never put a figure into their works of this class. Unless it was a bald bit of country made up merely of hedgerows, grassy slopes, and trees, a photographer had no claim to the landscape class, and thus those who attempted to introduce a little "life," or to give "an eye" to their picture by means of animated nature, were relegated to the "genre" class, where the prizes were few and scant. The "Instantaneous" class leads to the same difficulty. Let us suppose a medal or series of medals to be given for this work; how is the word "instantaneous" to be defined, and are we to include only *tours de force*, or, so to speak, marvels of rapid exposure in the category? Such things as a man leaping a gate, or a horse running, are wonders in a way, if well done, but they are not more instantaneous pictures than some of the little landscapes that Gale and Brightman have shown us. Yet these last examples of still life would never be classed as "instantaneous," but would have to take their chance, side by side with big, broad, landscapes, whose effects eclipse them entirely.

It would, then, we submit, be better if in future our exhibitions were to admit no pictures but those qualified to take medals (if medals form part of the programme), and if only those appointed as judges should classify the pictures, supposing the awards are divided into classes. In regard to the latter point, however, we repeat what we said on a former occasion, that the less classification there is the better. An exceedingly good plan is, to place a certain number of medals in the hands of the judges, and to depend upon these gentlemen to make the best distribution they can of such awards.

FRENCH CORRESPONDENCE.

The Pavloffski Process—Mechanical Printing with Gum—New Photo-Engraving Process—M. Mauduit's Electric Shutter—Wide Angle Lenses on Rozmouski's Principle—Death of T. B. Dumas—Exposures and Photometric Tables.

The Pavloffski Process.—After reading the description of this process in the last number but one of the Photographic News, I was struck with the possibility of adapting it to ceramic decoration. Unfortunately, the process was not fully described, as many metallic oxides and other colouring matters are altered by bichromate of potash, resulting in combinations not sensitive to light, while the oxide is modified, as with oxide of iron, for instance. The same thing does not occur when the powder process is employed, as the powder is used dry with the sticky glaze, and no time allowed for a chemical action to produce any harmful reaction; and as the coloured powder is not applied until after the light has done its work, there can be no loss of sensitiveness.

Method of Mechanical Printing with Gum.—This led me to try a mechanical method of Woodburytype printing with ink made of gum-arabic dissolved in water, added to vitrifiable colouring matter, made sufficiently thick. In my first experiment, I made a 25 per cent. solution of gum-arabic, and let it evaporate in the water-bath until it was of a semi-syrupy consistency. The colouring powder ground on a muller with gum-water was next introduced in small quantities at a time, shaking it well to disperse the colour throughout. The liquid, filtered through muslin, and left for a moment, was poured on a Woodburytype mould previously greased. A piece of smooth paper, having been pressed against the mould for a minute, was backed by unsized paper soaked in rectified alcohol, and pressure was again applied for five or ten minutes. The alcohol coagulating the gummy ink, allowed the image to detach itself from the mould just as if gelatinous ink had been employed. All vitrifiable powders, provided they are not too heavy to be held in suspension in the gum, may be used in this way. The surface of the paper ought to be well sized and glossy, at the same time permeable to the alcohol. The bare principle of my process is here indicated, but details will be given after making a sufficient number of experiments.

New Photo-Engraving Process.—If I mistake not, the Talbot photo-engraving process consists in a copper plate coated with a film of bichromated gelatine exposed behind a negative, and bitten with perchloride of iron. It seems to me that an interesting modification may be made. A smooth plate of copper must first be covered with a five per cent. alcoholic solution of resin. After evaporation, the resin will be left on the surface in a finely powdered state, and is made to adhere to the copper by heating it. This done, a print is taken from a positive on carbon paper and stuck down to the copper, then developed with hot water in the ordinary way. A negative image remains adhering to the copper by the resinous film. When dry, the edges and back of the plate are protected with bituminous varnish, and it is bitten with an aqueous solution of perchloride of iron. The liquid biting through the gelatine passes also through the resin, which gives a fine and regular grain over the whole surface.

M. Mauduit's Electric Shutter.—M. Mauduit has changed the action of his instantaneous shutters by substituting for the compressed air cylinder another cylinder having iron pistons working by electricity. It is very simple, and allows of the exposure being regulated at a much greater distance from the camera. The generator is a pocket sulphate of mercury battery.

Wide-Angle Lenses on M. Rozmoustri's Principle.—Two employés of M. Rozmouski have set up together to make the wide-angle lenses they had previously constructed with this clever optician. The lenses are very small. The 9 by 12 and 8 centimetres focal length measures only 15 millimetres in external diameter, by 15 to 16 in length. The 13 by 18, with 12 c.c. focal length, is only 20 millimetres in diameter by 24 in length. They embrace an angle of 80°, and are excellent, in spite of their dimensions. It is to be hoped that MM. Jarres and St. Martin will be encouraged in their work.

Death of M. Dumas.—The sad news of the death of this illustrious chemist has reached me. Photography, in particular, owes a great deal to M. Dumas for the service he has rendered since its birth. He assisted Daguerre with his purse, in his researches leading to the discovery of fixing the image on silver plates. But since then he gave great help to

the art; no one among our *savans* interested himself so much in it as he. His death will be a great loss to science, and Dumas did not live to the age of eighty-four without accomplishing the most complete work that a man ambitious in the right sense could dream of realising.

New Edition of Calculations for Exposures and Photometric Tables.—The second edition of my "Calcul des Temps de Pose" has just come out at the publisher's, Gauthier-Villars. It is the forerunner of the "Manuel de Touriste Photographe," with which it will be indispensable.

Leon Vidal.

TRACING ON GLASS FOR THE LANTERN.

BY W. B. WOODBURY.

Some four or five years ago, possibly more, I gave, in one of the almanacs, a process for tracing designs on glass for the lantern, which, if it had only been followed up, would, I am sure, have been much in use at the present day, and such things as ground glass *a la* transparent slate, and other like systems would be put entirely in the shade. It was simply a varnish composed of dammar in benzole or chloroform, to which a few drops of india-rubber solution had been added. After an hour's drying, it was ready for use. With a fine lithographic pen dipped in indian ink the finest drawing can be executed. I have myself written my name in full, "Walter Bentley Woodbury," in the diameter of a four-penny piece; and by means of a small piece of damped card attached temporarily, have, by the aid of drawing instruments, made some fifty circles in the space of a couple of inches. The advantages are that the glass is perfectly transparent, and even under a high power the lines show no sign of raggedness.

I should be glad if some of your readers, interested in this work, would give it a trial and report on it—*pro bono publico.*

POITEVIN'S PHOTO-RELIEFS.

BY WILLIAM LANG, JUN.*

In my former communication to the Society, I made a passing reference to what the French chemist, Poitevin, had done in the way of forming relief pictures; but I was unable to bring before you any examples to illustrate his method of procedure. Since our last meeting I have made several experiments, following out, with some slight modifications, the lines laid down by Poitevin in his "Traité des Impressions Photographiques." A copy of this work is lying on the table. It is the second edition brought out last year by M. Leon Vidal, who is, as you are aware, a no mean authority in photographic matters. Each chapter is followed by an appendix, written by M. Vidal, which adds greatly to the value of the book, and enables the reader to form a more correct estimate of the truly original nature of Poitevin's researches.

It is not only interesting, but instructive, to go over the ground traversed by the pioneers of photography; and among the many processes that have become historical, Helioplastie, the name given to his process by Poitevin, or sun-modelling, as it may be rendered in English, is by no means one of the least suggestive. It is simplicity itself. There are not many processes where all the development required consists in immersing the plate in cold water. When we consider that it was about the year 1848, almost forty years ago, that Poitevin conducted his experiments, the wonder is that long ere this there has not been some practical application of the work he then did. For your inspection I have here an intaglio in moist gelatine produced from a negative, and its accompanying plaster cast. Here is an electrotype, got from one of these plaster productions, which will give an infinite number of prints with gelatine ink in a Woodbury press. I have drawn one or two just to illustrate the principle before coming to the meeting, and they can be examined, although somewhat rough in appearance; this is due, not to any imperfection in the process, but to my not having prepared the plaster cast in a sufficiently careful manner for the delicate operation of electrotyping.

* Read before the Glasgow and West of Scotland Amateur Photographic Association.

To show the difference in the nature of the reliefs obtained when employing a positive, and when a positive picture and a negative one, here is a gelatine relief picture which has been exposed behind a positive, and with it the plaster reproduction. It seems to me some of you professional men might revive with advantage to yourselves these sun-modelled pictures; they would be something new, I think, to the present generation. The face as seen in profile would undoubtedly be the best pose; further, having got your plaster-mould, casts could be taken in white wax. There is no end to the many modifications that one could work out in these matters. To show how perfectly the minutest detail is preserved in these plaster pictures, here is a small landscape subject. It occurred to me that it would be interesting to try the effect of producing a plaster relief from a photograph of some statue. I accordingly got a print which you see here; it represents the goddess Hebe. Having waxed it and put it into a frame in front of a prepared film, on developing, the mould presented the appearance it has here, and the plaster cast from it reproduces very fairly in bas-relief the original character of the statue. It wants, of course, the rounded character of the original figure, but perhaps, by shading the outer portions of the figure, a rounded character could be conferred to the mould, and subsequently, of course, to the plaster cast. I have not had, however, the necessary time to do anything in this direction.

I may mention that the films used in these experiments were prepared from Nelson's gelatine, one ounce to eight ounces of water, a certain amount of sugar and glycerine having been dissolved in the water. Poitevin seems to have worked with gelatine pure and simple, but you will readily understand that plates prepared thus dry badly. I dried the plates at a temperature of 90° F. or thereabouts—not exceeding it, however—in a drying-box after England's pattern. A concentrated solution of bichromate of potash was added to the warm gelatine just before coating, sufficient to give a slightly yellowish colour to the solution. Contrary to what might be expected, a very thick film is of no advantage. In coating, I first got a level place on the table, put the plate down, and surrounded it with strips of thick plate-glass, cuttings of shop window glass, arranged to form temporary slides; when set, the glass was withdrawn, and the plates removed to the drying-cupboard. Filled up to the level of these thick glass sides there is always a uniform quantity of gelatine left on the plate.

PHOTO-MICROGRAPHY.

BY WILLIAM GOODWIN.*

Those who use the microscope for the study of natural history are fully alive to the value of photography as a means of registering their observations; but the great majority are deterred from attempting its use by the idea that it is difficult as regards manipulation, and costly as regards apparatus. The various text-books of microscopy are greatly to blame for this, and certainly their descriptions of heliostats, electric lamps, and special microscopes are alarming. I hope, however, to show you that in these days of dry plates much may be done with very simple apparatus and little trouble.

There are microscopists whose interest lies rather in raising the microscope to the highest pitch of optical perfection than in its use for the purpose of study; and doubtless, with the enormous magnifying powers now at their command, manipulation does become difficult, and apparatus costly, when they call in the aid of photography to test the latest optical triumph. The other, and larger, class, who, in pursuit of knowledge, use the microscope only as a tool necessary for their work, would welcome photo-micrographs for their indisputable truth and manifest advantages over camera-lucida drawings. For such work as they require, you see here all that are necessary—a good, firm microscope, a quarter-plate camera, with dark slides (the lens, of course, is removed), and a source of light, which, in this instance, is a magic lantern, although a paraffin lamp will do as well. The condenser between the lantern and object is the "bull's-eye" provided with every microscope. The body of the microscope should be short, if possible. Mine, as you see, has a short body, with sliding tube for lengthening. As this tube contains a diaphragm which would lessen the field if used full-length, I keep it pushed in, and make up the length by means of this wider tube on the camera-front. A pasteboard tube, well blackened, would do for this purpose. It is advisable that there should not be a rigid connection betwixt the microscope and the camera, as putting

the dark slide in place might disturb the focus. The eye-piece as a rule, is removed, though very minute objects may require its use, but then the loss of light is enormous.

Microscopic lenses or "objectives" are, in all good microscopes, achromatic combinations, and may be divided into two classes, wide angle and ordiuary. The first have greater revolving power—that is, the power of showing minute details of structure which might escape the narrow angle objectives; but, on the other hand, these latter have more penetrating power or "depth of focus,' and when the object is of appreciable thickness will show, with comparative sharpness, parts lying in different planes. This is the more fortunate, since the ordinary lenses are much less costly than those of wide angle, and are the class generally supplied with so-called "college" or "medical" microscopes.

Here is the leus I find most useful; it is called a one-inch objective, and is so called because it has the magnifying power of a single lens of one inch focal length. To increase its penetration, I have reduced its aperture by a-half with a paper diaphragm, and have still plenty of light. Here is one of quarter-inch focus, much more powerful. Here is another, to which I would direct your special attention. It is now of 1½ inch power, but by turning this collar I can decrease its power by degrees to 4½ inches. This means that a comparatively large object may be viewed as a whole, and magnified a few diameters, and then the power being increased, it may be examined in detail. There is a scale on the revolving collar for registering the power employed. In photography this lens is remarkably useful, as the object can be enlarged just sufficiently to cover the focussing screen; it is, however, only available for comparatively large objects.

I should like to ask any of our members who are well up in optics, if there is any reason why we should not have a variable lens like this for landscape work? It would be peculiarly useful to us in the West of Scotland, where at one time we are doiug a "bit" in a glen with most of the picture within a few yards of the camera, and next minute have to deal with hills ten miles away. Under these circumstances a lens of variable focal length would be very desirable.

The greatest difficulty in photo-micrography is to judge exposure. It varies with every objective and with every object. The thickness, and particularly the colour, of the preparation must be considered. Parts of insects are, as a rule, of a reddish-brown tint, very non-actinic, and require long exposures; while botanical preparations are generally colourless, or green, and require much less time.

As a rule, with an object which is new to me, I give an exposure which I know must be full, and develop with hydrokinone, using a minimum of sodium carbonate to begin with. The image comes up very slowly, and is perfectly under control. When I know the right exposure, I give it, and use Edwards' developer, which seems to give a very fine grain to the negative. Too much density should be avoided, as it is often desirable to make lantern transparencies, or gelatino-bromide prints, from micro-negatives, and for such work a rather thin negative, with lots of detail, is best.

It is generally stated in works on microscopy that the chemical and visual foci of objectives do not coincide, and that after focussing, the objective should be moved closer to the object to an extent only to be found by experiment. This is doubtless true in theory; but so far as any of my lenses are concerned, I have found that a sharply-focussed image gives a sharp negative. It will, however, be found that, when using a low power, the objective may be moved through a very minute fraction of an inch on each side of the point of absolute sharpness without apparent detriment to the image; in such a case, it is advisable that it should be moved to the nearest point to the object consistent with sharpness; it will then be in focus for the blue rays.

My subject may not be of much interest to the most of you, but, after seeing the operation of making a micro-photograph, you may be able to convince some doubting friend that it is not so very difficult, after all. It is interesting to note, by the way, that probably the first gelatino-bromide plates were used for this work since Dr. Maddox, to whom, I believe, we owe the process, is an eminent mioroscopist, and uses photography largely in his researches.

The apparatus I have shown you is simple and inexpensive enough, but good work may be done with a home-made camera. My first attempts were made with a curious-looking affair made from some old boxes and a bit of black velvet, and were quite successful. I found, however, that some objects required direct sunlight to do them justice, and then a well-made camera and dark slide are assuredly necessary.

LANDSCAPE PHOTOGRAPHY FOR AMATEURS.

BY J. P. GIBSON.*

The art of feeling or faculty is, I believe, much more common to humanity than is generally thought. The power of expressing this art feeling is very rare with us. Much as has been done by our schools of art and by our wonderful illustrated literature, we are still very far behind our neighbours, the French, in the individual power of artistic expression.

I am afraid no words of mine can do justice to the value of photography as a means of giving expression to this art feeling, and as one of the most powerful auxiliaries to artistic training that exists. It has taught us, as nothing else could teach, the value of form, and has impressed on our artists the necessity of careful and accurate drawing; it has swept away ruthlessly the wretched and ill-drawn book and periodical illustrations so commou a few years ago, and is gradually but surely filling their places by its own productions or reproductions. But what more especially concerns us to-night is that it places in the hands of the man who is possessed of artistic feeling, but who is devoid of artistic training, a wonderful pencil by which he can give form, expression, and vitality to the art faculty within him; that pencil is the pencil of nature. Nature in her varied moods lays herself at his feet.

To merely enumerate all things that photography enables us to do would occupy more than the time at my disposal, so I must pass on without delay to the pleasure that can be obtained in doing these things, aud proceed to consider photography as a means of recreation. Landscape photography is a specially out-door occupation, and it lures us away from the office, the counter, the workshop, out of the reeking and murky atmosphere of the steam-driven town, to what the master of word painting, Ruskin, calls "the wild yet gentle country life, monotonous as the succession of the noiseless waves, patient and enduring as the rocks, but peaceful, and full of health and quiet hope, and sanctified by the pure mountain air and baptismal dew of heaven, falling softly between days of toil and nights of innocence;" and to do this it is not necessary that we should travel to Switzerland or the Rhine. We need not even go to North Wales or "bonnie Scotland."

Wandering with my camera by the banks of South Tyne last month, I met a south country gentleman, who, after some conversation on Tyneside scenery, said:—"I had heard all my life long of the beauties of Cumberland, and came North specially to see it; I have seen it, and, fine as it undoubtedly is, it is not a patch upon Tyneside." Had my in-bred Northumbrian reserve not held me back, I could have embraced him on the spot. We Northumbrians may well be proud of our old borderland couuty, which possesses historical associatious equalled by few, surpassed by none. She has aptly been termed the castled shire, for feudal castles crown her gentle slopes and wave-beaten precipices, and remains of the peel towers, into which our forefathers drove their herds to prevent them being harried by the invading Scots, are to be found in almost every hamlet. Archæological and architectural subjects for the camera meet us at almost every turn, even within the precincts of this very city, and when man has done so much for Northumberland, what has not nature done? Those who are acquainted with our Northumbrian rivers and their numerous and beautiful tributaries "the burns," from which our great Tyneside artist, Thomas Bewick, drew much of his inspiration, can fully testify to the truth of this. And here let me recommend to landscape photographers, as being most rich in subjects suitable to the camera, the river scenery of England.

To those present I would specially recommend the scenery of our own grand river, which we are accustomed to hear spoken of so slightingly as the "Coaly Tyne." Poets have sung the beauties of most of our English rivers, but have been strangely silent about the Tyne. This can arise from only one cause, that is, that the upper reaches of the Tyne until recently have been little seen and known, except by those earning their livelihood on its banks, who are not, I am sorry to say, a poetic race. The Waverly route of the North British Railway has opened out the beauties of the North Tyne to all in search of the picturesque and the beautiful, and some of its most charming scenes can be reached in little more than an hour's ride from Newcastle.

Lawn tennis, bicycling, cricket, and football, are each admirable in their special way as recreations for young men, but to those who have passed their first youth, or to whom such violent

* Abstract of a paper read at the Annual Lantern Meeting of the Newcastle and Northern Counties' Photographic Association.

exercise is objectionable, I would most strongly recommend landscape photography as a recreation. It gives us fresh air and exercise, combined with an amount of excitement and mental occupation sufficient to render it thoroughly interesting and enjoyable.

Laudscape photography will meet all your requirements, furnishing you with the requisite exercise, as well as the motive for taking it; and if physicians would only prescribe its practice as a remedy, instead of giving nauseous draughts and pills, renewed strength and vigour would accrue to their patients in a marvellous manner.

And as no tragedy attains to perfection without some trace of comedy in it, so no occupation can be a perfect recreation unless it is enlivened by occasional gleams of fun and humour. These gleams are met with oftener in photography than in any other art or calling.

An expensive outfit is not by any means requisite for landscape photography. It is, I think, most convenient for an amateur to commence with a quarter-plate camera—that is, one taking photographs on plates 4¼ by 3¼ inches—as it is much less costly to work, and much more portable than those of larger size; for lady amateurs this size is specially suitable. From the negatives taken in such a camera, carte-de-visite views and magic lantern slides can be got by direct printing, and by the aid of an enlarging lantern bromo-gelatine paper prints can be made, up to about 16 by 12 inches, with very good results. A portable camera of this kind, with three or four double dark slides for the prepared plates, can easily be carried in the pocket of a shooting-coat, or in a very small satchel. A light stand may be got which can be used as an alpenstock in hill climbing. Such an apparatus can be had complete from about £3 to £12.

After having thoroughly mastered the technical details of dry plate work, the amateur may proceed to attempt photographs of a larger size; when the camera is required to be carried for long distances by the photographer himself, a camera taking plates 7½ by 5 inches is very convenient, as a whole-plate camera —that is, one taking views up to 8½ by 6½ inches—is very apt to feel heavy at the close of a long day's tramp over rough country roads.

By the use of a simple adapting back, quarter-plate views can be taken in the larger camera, and with six large and six quarter-plate dark slides filled with plates, the amateur is fully equipped for a long summer day's work. I prefer double dark slides to any arrangement for changing the plates during the day's work, the latter wasting time in the most valuable part of the day, and also causing a considerable risk of injury to the plates. In selecting an apparatus, let the beginner carefully avoid one having many loose pieces, and before starting to work, let him make out a written list of the materials required for his day's work, and carefully check it off before starting, to see that he has forgotten nothing. It is a little depressing to find, when miles away from home, that the lens, has been left behind.

Coming to actual out-door work, let me recommend beginners to try at first simple effects of lighting, such as can be obtained with the sun on one side of and slightly behind the camera, as brilliant and satisfactory looking negatives are most easily got by this method of lighting. With the sun straight behind the camera a direct front light is thrown upon the landscape, which is usually the very worst form of lighting possible to work with, the resulting pictures being flat, tame, and spotty. Occasionally, with subjects which possess great contrasts of light and shade in themselves, even a front light may be utilized.

In photographing wooded landscape, the sun almost immediately in front of the camera, and just kept from shining on the lens by a sky shade, gives perhaps the greatest chance of obtaining artistic effect to the photographer, who has thorough mastery over manipulative detail, as nature seen right under the sun reveals many beauties otherwise hidden. Under the sun the shadows are broad and massive, and the heavy summer foliage seems surrounded by a halo of light caused by the reflections from the upper leaves, which glisteu and sparkle in the glad sunshine like numberless jewels. In attempting to obtain effects of this kind, every possible precaution must be taken to prevent the evil known to photographers as halation. Fine effects may often be got on days when there is no direct sunshine; a weak diffused light suits best heavy masses of foliage and deep wooded glens, such as those in which most of our "linns" are situated.

While the attention of the photographer is directed to the landscape, atmospheric effects should not be neglected, and an opportunity of taking a fine sky should never be lost, as he who does not make his skies a material part of his picture neglects to avail himself of one of his greatest aids. In the works of all the great landscape painters the skies seem to sympathise with and form part of their subject.

The practice, so common with photographers not long ago, of treating the sky as a white sheet thrown behind their landscape, is now fast becoming obsolete, and in almost all exhibition pictures, and in many procurable in the shops of photograph dealers, we find natural skies either produced in the negative by the use of a sky shade during exposure, or by the more troublesome but more effective way of printing-in a sky from a separate negative taken specially for that purpose. Mr. H. P. Robinson, of Tunbridge Wells, our leading art photographer in England, whose fine pictures at the last Newcastle Photographic Exhibition attracted so much attention, in one of his recent publications on artistic photography, insists strongly on the fact that almost all successful photo-landscapes recently exhibited have had skies printed in from separate negatives; and chief among books that may be studied as helps to the landscape photographer, let me recommend Robinson's "Picture Making by Photography;"* also Ruskin's "Elements of Drawing;" and last, but not least, Frank Howard's "Sketcher's Manual."

Having surmounted technical difficulties, the amateur will find it to his advantage in every way to turn his attention to some special and definite purpose. To attain excellence in a special line is better than to be content with mediocrity in many, and it is by steady, earnest, effort in one direction that the best results are most easily accomplished.

I may point out a few of the special objects easy of attainment to many among us. The amateur whose bent is towards natural history may devote himself to animals, flowers, and ferns, or may turn his attention to micro-photography. The geologist may find subjects in a series of the out-cropping rock strata of our own county, which, I believe, has never been systematically photographed. To the archæologist there exists a great choice of subjects, a few of which I may mention:—The Roman Wall and antiquities connected with it, Northumbrian feudal castles and peel towers, our old parish churches, Saxon crosses, and quaint gravestones and tomb covers, picturesque old houses and thatched cottages which are rapidly disappearing from among us, too often, alas! to clear the way for the "jerry" builder; and bits of old Newcastle, which daily are becoming rarer, and of which it is well to keep pictorial record.

Let me conclude with a word of warning to the beginner—Do not attempt too much at first. There comes in photography a quick and stern Nemesis; frequently it comes after a tour with the camera amid beautiful and enchanting scenery, when in the silence and lurid red light of his developing chamber he attempts to bring out the images of beauty latent on his plates. One after another is plunged into the developing solution, but instead of the expected pictures there results only fog! fog! hopeless and universal fog! We may all take warning by the fate of the ambitious youth of heathen mythology, Phæton, who essayed to drive the horses of the sun; and we must remember that the horses of the sun-god whom we photographers so ardently worship will not be driven, but must be gently led.

Notes.

Next week Dr. Eder will communicate an important article on "Increasing the Sensitiveness of Gelatine Plates to Coloured Rays."

Mr. W. J. A. Grant has sailed again North, with Sir Henry Booth as a companion, in the little yacht *Kara*. This time it is a sporting expedition to the Polar Seas that these gentlemen are engaged in, the little 40-ton craft having on board a full equipment of guns and harpoons. But Mr. Grant has not forgotten his camera on this, his eighth trip to the arctic regions, and hopes to bring back with him some pictorial reminiscences of sport in high latitudes.

* Published by Piper & Carter, 5, Castle Street, Holborn.

Major Elsdale, R.E., who has just been appointed superintendent of military balloons at Chatham, has obtained some very successful balloon photographs from small free balloons. He permits the balloon to rise with an automatic camera, which takes photographs as soon as a certain altitude is reached, and the balloon with apparatus is recaptured on its descent. Supposing a city to be beleagured, the investing force would thus be able, by taking advantage of a favourable breeze, to reconnoitre with success. In one little picture Major Elsdale has taken, a party of troops may be counted by the white dots of their helmets.

Here is an interesting case just decided by the Paris tribunals. A painter of Paris authorised M. Lecadre to photograph and publish photographic prints of two paintings, but he afterwards sold the paintings in question for 3,000 francs to M. Barboza, informing the latter, however, of the photographer's rights. M. Lecadre sold photographs of the paintings, but also photo-gravures of them, and to the latter M. Barboza took exception. He asked the court to interfere, and to order the destruction of the copper-plates employed to produce the photo-engravings. But the law has decided in favour of M. Lecadre. It is admitted, says the judgment, that photographs might be sold, and also Woodburytypes; why not, therefore, photo-gravures? It is true an engraver might be necessary, as M. Barboza says, to retouch the copper plate in places, but retouching is also necessary in an ordinary photographic print. M. Lecadre is, however, forbidden to sell coloured photographs, as these are outside the rights he acquired.

Mr. J. P. Mayall is publishing a monthly photographic work entitled "Artists at Home," each edition containing four portraits of academicians or associates taken in their studios "while surrounded by the pictures, sculptures, and other objects of art" characteristic of the different artists. Possibly, there is no class that speaks more deprecatingly of photography than painters, nor patronises it more extensively.

The ink ordinarily used with india-rubber stamps is a solution of an aniline colour in glycerine, and the impressions are generally so fugitive that a few hours' exposure to bright summer sunshine reduces them nearly to invisibility. We have, however, found that by stamping with a mixture of equal parts of a saturated solution of nitrate of silver and glycerine, excellent impressions are obtained. These are of course invisible at first, but they gradually become jet black. Still, it has surprised us to find that in ordinary cases the maximum intensity is not attained for some months.

We communicated our observations to the enterprising bill-sticker, to whom we suggested the use of bichromated paste (vol. xxvii., p. 681), and we regret tosay that he has been printing advertisements in railway carriages with the silver ink. Strange to say, the impression holds very well to the surface of paint.

Other applications of the method suggest themselves. By making an ink with an iridium solution and glycerine, we have obtained impressions on glass which became very vigorous and distinct when fired. Gold, platinum, cobalt, and other metallic solutions can thus be used for decorating glass and pottery.

"The greatest difficulty in photo-micrography is to judge exposure. It varies with every objective and with every object. The thickness, and particularly the colour, of the preparation must be considered." So says Mr. William Goodwin in a paper which will be found in another part of the News.

Says the *Artist*: "The directors of the 'Musées Nationaux de France' have just taken an important step. A contract has been passed with Messrs. Braun for the reproduction by photography of 7,000 of the best paintings in the collection, and these will be offered for sale at a relatively moderate price. After a lapse of thirty years the negatives will become the property of the government.

English photographic literature is looking up. It is only the other day we announced that Mr. H. P. Robinson's "Pictorial Effect" was appearing in French; now we find that, under the auspices of the Vienna Photographic Society, it is to be translated into German.

Messrs. Piper and Carter promise Mr. H. P. Robinson's new work "Picture Making by Photography" next week; it will be profusely illustrated.

Mr. Alfred Brothers wants to know "why we should adopt the metre instead of the yard" as a basis for decimal measurement. Unfortunately, his question comes a little too late. There might be a hundred reasons as good as the one Mr. Brothers mentions in favour of the yard, but they would be to no purpose. All scientific men, those in England included, have long since given in their adherence to the metre, which is, moreover, in domestic use in France, Germany, Italy, and Austria. The only question for discussion really is, how long the photographer in Great Britain will hold out against the metre; it is a mere matter of time.

Dumas, the eminent French chemist, who died last week, was secretary of the *Academie Française*, and one of the representative men of European science. His "Chemistry Applied to the Arts" was the first work to earn him fame, but since the year 1821 he had been before the Paris public. Dumas took much interest in the invention of Daguerre, and was consulted by Madame Daguerre on the sanity of her husband just prior to the latter making known to the public the marvels of Daguerreotype. Still, in spite of his age, Dumas was not the Nestor of French savans; Chevreul, a brother academician, who is still alive and well, and who but the other day reminded his brethren how he had addressed them in the year 1813, was ten years older than Dumas, who was born with the century.

Photography has pretty well killed one branch of art—the painting of magic lantern slides. This is not a matter for much regret, as the calling does not appear to have been particularly lucrative. An artist who has now risen to celebrity once told us that in his early struggling days he was offered an engagement at the Polytechnic Institution to paint slides for the dissolving views. The salary was not high, but he would have accepted it had it not been coupled with one drawback—the painter was expected to take a part in the then newly-invented "Ghost Entertainment!" Our friend thought it was necessary to draw the artistic line somewhere, and he drew it at the personal representation of hobgoblins.

Some very droll errors appeared in the M.S. index to the applications made during last year to the Patent Office. Under the heading "boats" is classed the common dinner table article known as a "butter boat," while ship's fenders are put down under "fire-irons." After this, one would not be surprised at hearing that gelatine plates were classed as "crockery ware," an improvement in sliding fronts as "wearing apparel," or instantaneous shutters as belonging to "shop fronts" or "window fastenings!"

On the occasion of the late Duke of Albany's obsequies, says *Truth*, the Queen telegraphed to Portsmouth, ordering that as soon as the *Osborne* arrived from Cherbourg, a photograph was to be taken of her dining-saloon, in which the coffin was placed, and which had been fitted up for the occasion in accordance with directions transmitted from Windsor. In the evening the electric light was fitted on board the Royal yacht by the Dockyard electrician, and an admirable photograph was taken, of which copies were ready next morning, and the Prince of Wales took several with him to Windsor.

We are hardly at one with the chairman of the South London Photographic Society in his statement that "in photographing views of common objects, such as shipping on the river, they would scarcely expect to get beautiful results in composition." On the contrary, some of the most picturesque bits possible can be got from the shipping in the River Thames, say about the Pool; and the wonder is that more has not been done in this direction by photographers. Of course if Mr. Statham meant that it was difficult to get anything beautiful out of the bare iron hull and gaunt steam funnel of an ocean-going trading steamer, we agree with him. But there is so much that is picturesque in the quaint Medway barges, the colliers, the ships of foreign build, and the innumerable small craft, that selection ought to be easy enough. Tall chimneys and huge blocks in the way of wharves and warehouses are certainly awkward, but even these may sometimes be dealt with effectively. We should be inclined to think that the thing to be avoided in photographing Thames shipping is that of attempting too much. The simpler the materials the less chance of getting something in the picture which spoils the composition.

Mr. Richard Keene, of Derby, has just published an "extra edition" of Mr. Edward Bradbury's "All about Derbyshire," illustrated by a dozen charming platinotypes in Mr. Keene's best style. It is a pity Mr. Bradbury strikes a discord in his interesting little work about people neglecting their own sweet country in favour of foreign lands. He complains that his countrymen "are strangely ignorant and scandalously neglectful of the beauty spots in our midst." Now we have generally found that a traveller abroad is generally a traveller at home, and moreover, that when a person deprecates foreign travel, he is not very strong upon home travel. We appreciate Derbyshire so highly that three of our summer holidays have been passed in the district, and we would make bold to avow that any average Englishman who travels on the Continent is as well acquainted with his native land as one who knows "All about Derbyshire."

We once heard a similar plaint by a lecturer on Scotland at the Polytechnic; he had been exhibiting some charming photographs of the land o' cakes, and wound up his discourse by regretting that Britons, instead of visiting the beautiful country at their threshold, must needs go off to Switzerland and the Tyrol. Why did they do this? he said reproachfully. We could easily have told him; the reason, as he himself would have known, if he enjoyed any practical experience in the matter, was simply that you can travel in the Tyrol for half the money it costs you in Scotland.

Patent Intelligence.

Applications for Provisional Protection.

6242. Jasper Wetter, Engineer, 67, Strand, Westminster, for "A new or improved process for obtaining photographic images on porcelain and enamelled or glazed surfaces."—A communication to him from abroad by Jean Antone Charles Burel, Nevers, France.—Dated 10th April, 1884.

6312. William Henry Preece, Wimbledon, Surrey, Civil Engineer, and Alexander Pelham Trotter, Furnival's Inn, Middlesex, Electrical Engineer, for "An improvement in photometers."—Dated 12th April, 1884.

6323. Heinrich Hugo Hund, Queen Victoria Street, London, Commission Agent, for "Improvements in frames for holding photographs and other pictures."—A communication to him from abroad by Albert Brüning, Berlin, Germany, Fancy Goods Manufacturer.—Dated 12th April, 1884.

Notice to Proceed.

5681. William Robert Lake, of the firm of Haseltine, Lake, and Co., Patent Agents, Southampton Buildings, London, for an invention of "Improvement in and relating to colour-printing, also partly applicable for producing coloured photographs and for similar purposes."—A communication to him from abroad by Auguste Bissen, of Paris, France, Heliographic Engraver.—Dated 8th December, 1883.

Patent Sealed.

712. Frederick Hazeldine, of Lant Street, Borough, in the county of Surrey, Contractor, for "Improved apparatus for use in washing photographic prints and other articles or materials."—Dated 4th January, 1884.

Notice of Application for Amendment of Specification.

In the matter of an application for a Patent made by George Duncan Macdougald, of Dundee, in the county of Forfar, North Britain, Chemist, for an invention of "Improvements in apparatus for storing and conveying developing and other chemicals required for the production of photographic pictures," No. 416, dated 2nd January, 1884.

Notice is hereby given, that the said George Duncan Macdougald has, under the sections 18 to 21 of the Patents, &c., Act, 1883, and Rules 48 to 56 of the Rules made thereunder, applied for leave to amend his Specification by (referring to the Queen's Printer's copy thereof) inserting in line 13 of page 2 the words "by the fingers," and in line 22 of the said page 2 the words "sufficiently to allow of the vessel being broken by the fingers," and on the said page 2 by striking out the paragraph commencing at line 28 with the words "another convenient form," and ending at line 32 with the words "releasing the chemicals," and also by inserting in line 13 of page 3, after the word "invention," the following words, "but I wish it to be understood that I do not claim as of my invention, or a modification thereof, ordinary sealed vessels without projecting tubes or without weakening incisions," and also to amend the drawing annexed to the said Specification by eliminating therefrom Fig. 3

Any person intending to oppose such application must leave particulars in writing of their objections to such proposed amendment at the Patent Office, 25, Southampton Buildings, London, W.C., within one calendar month from this date.—Dated this 11th day of April, 1884.—H. Reader Lack, Comptroller General.

Patent Granted in America.

296,055. Homer E. Pierce, Brooklyn, N.Y.—"Stereoscope." Filed January 14th, 1884. (No model).

The claim relates to an adjustable arc joint for varying the angle of a stereoscope on its standard. The arc piece is toothed on its face like a gear-wheel, and a pin passing through the support serves to lock the arc at the required angle.

ELECTRICITY IN A PROVINCIAL STUDIO.

Something less than an hour's ride by rail, ten minutes' walk through a small country town, and we are at our journey's end. A small show-case, with half-a-dozen pictures mounted on gilt-edged blocks, secured to a backing of quilted "old gold" satin, marks the house. The sides of the interior of the case we strongly suspect to be coated with luminous paint. Passing through the usual reception room, with specimens of glass cases and frames, we descend to the garden, where printing is being carried on. We observe a turn-table for vignettes, which consists of a large hoop across which copper wires are stretched, to give a rest for the frames, rotation being obtained by the old-fashioned method of a hank of worsted some five feet in length. Good worsted, we are told, will keep the hoop moving quietly for about half-an-hour, and will last out of doors for more than six months.

To reach the studio, some ninety feet of garden must be traversed; a bad thing for sitters in wet weather, we should say. Several miniature telegraph lines are swinging across between the studio and house, for purposes we shall note presently.

The studio presented its light side to the north by an area of glass some twenty-five feet long by twelve high, placed at such an angle that the top was considerably over the centre of the floor. The blinds were fitted with the old-fashioned spring rollers, some black and some white, and seemed to afford perfect control over the lighting.

From the hanging arrangements for plants, creepers, &c.—some green even now—it would present a pleasant aspect during six months or more of the year. The most conspicuous object was a large-faced electric clock on the south side, which at the time of our visit had been going for twelve months without any more attention than one filling up of the battery which works it, and an occasional adjustment to time. It was provided with a half-second pendulum, plainly seen and equally plainly heard, and this was invariably used for ordinary exposures. One complete oscillation of two arcs would, of course, be a second, one arc half a second, and half-an-arc one quarter second, the shortest time required in any studio portraiture, and that actually given last summer for full length *mignonne* cartes with short focus lens.

Attached to this clock, we remarked, was a wire independent of that which applied the electric motive power This was one of the lines passing from the studio through the air outside, and was employed to transmit periodical currents at one-minute intervals to the house. The object was to work another clock, which should keep fairly correct time without any alteration whatever, and we were told that it entirely answered its purpose. The arrangement for transmitting periodical currents was novel, but would take up too much room to explain here; but we are quite at liberty to communicate it to anyone desirous of knowing. The secondary clock was worked on a French system, and was exceedingly simple.

There were three cameras, on stands, available for work, one being a 12 by 18 for enlargements, each one fitted with an electrical shutter for exposure, and all worked by a battery of three cells, hanging to the usual portrait camera-stand; connection with the other cameras being made instantly by the same means as that employed in the carriages on the South Eastern Railway. By this means one long flexible wire-cord and electric push answers for every description of work. The shutters in one were arranged to act on the guillotine principle, being really two shutters or screens, formed of cardboard and leather, to fold up like a camera-bellows, occupying a very small space just behind the lens.

After finding that both screens were raised, a process quickly done by the touch without looking into the camera, and upon the pressure of electric button, one screen dropped, and a second pressure allowed the other screen to fall, and concluded the exposure. The whole process seemed to be very simple and certain, and a glance at the clock pendulum before described—the press button being in the hand—renders it easy to regulate the time for rapid plates. The shutter is thus made to act with two separate currents, to allow time when copying with wet plates or slow, dry films, as in the case of chloride emulsion, thereby causing economy of battery power in several minutes' exposure; the plan is to have the press button near the studio or dark-room door, and work the shutter from either point to assure perfect absence of vibration from movement in studio, and yet leave the operator free to utilize the time during exposure. Another piece of apparatus to be presently described is also sometimes employed, by which, after opening the shutter from a distance, the place can be left entirely, the closing at the right time being done automatically, and notice of same given upon a bell.

We have before remarked upon the wisdom of having some cheerful object towards which to direct the sitter's eye in place of some ordinary photograph from stock of samples; and we here observed several humorous pictures produced by copying from pen-and-ink or from American journals, and printed in cyanotype—not an unpleasant colour for the sight to rest upon.

The dark-room was lighted by a window of an area of four square feet, and glazed with deep cathedral amber and green, over which tissue paper was secured, development being effected within eighteen inches thereof.

For very dull days and late exposures, this was supplemented by a reflecting lantern, somewhat like that suggested by Mr. Cowan, with yellow paper reflecting surface, and deep amber glass in front. In every case, however, to ensure a fairly equal density in all negatives, the proper duration of development was judged by glancing through them at the direct rays from a small lamp with a circular opening of one inch and a-half, covered with one thickness of ruby glass, varnished with canary varnish.

We noticed a rocking table or slab with pendulum, upon which plates were developed, the weight of which, hanging near the ground, was formed of a large bottle of water, painted over with luminous paint, so that its movement could be noted in the shadow, even when the table was covered to protect plates from light during prolonged development. Close at hand was a telephone with its transmitter, and key to work an electric bell. The dark-room

being some hundred and fifty feet from the reception-room, laboratory, and printing department, it seemed calculated to save time and trouble to have this facility for calling for anything required, or intimating the arrival of sitters, and stating their requirements, while the work at the studio was going on. The like arrangement we afterwards saw in the printing room, at the other end of one of the aërial lines upon which we have remarked. The telephones were such as could be purchased at any electrical shop in parts, only the bobbins of wire usually supplied were replaced by somewhat larger ones, combining about one ounce and a-half of No. 36 silk-covered copper-wire. The transmitters, we were told, might possibly be the subject of some patent, but were evidently within the province of anyone possessed of a little ingenuity to construct for himself. The heads of a pair of telephone cases were used for the purpose, and at the bottom of each box-like opening was fastened a disc of common tin plate. The top was fitted up like a telephone with a diaphragm of ferrotype plate, only the varnish had been removed from the back of the plate, and the iron laid bare. This iron had been dipped for a second in acid solution of cupric sulphate, washed, and then immersed for a few seconds in a weak solution of mercuric nitrate, to amalgamate it, and after washing attached to the wire from the zinc pole of a weak galvanic battery, and plunged into an old cyanide fixing-bath rich in silver. The carbon of the battery had previously been fastened to an old silver spoon, which was also immersed in the cyanide-bath. After a few hours sufficient silver had been deposited on the plate to answer the purpose, and it had been washed and rubbed with whitening and was ready for use. The space, some five-eighths of an inch, left below the tin-plate and the silvered back of the diaphragm, had been filled up somewhat loosely with small pieces of coke, the largest about the size of a small pea, and the smallest not less than the tenth of an inch. This completed the transmitter; and when the tin-plate was connected with the telephone, and the diaphragm with one pole of three old Leclanché cells, the other pole of the battery being connected with the earth or gas-pipe, and the other end of the telephone attached by a switch to the line running between the places, the apparatus was capable of transmitting messages with clearness and power. It was evident that a disc of stout silver would have at once proved to be the best for diaphragm and back-plate, and have saved considerable trouble.

An arrangement something like that adopted by the telephone companies was employed to cut off the battery, and substitute the bell and key for the telephone, by means of the weight of the latter when it was not in immediate use. The developer then in use, we were told, was pyro and carbonate of potash with sulphite of soda.

Passing through the studio on our way out, we noticed that at one end several backgrounds were hinged at the side, so that they could be changed in a moment as desired.

A somewhat novel electrical arrangement was pointed out to us in the laboratory, where paper was being sensitized. It was a common little round American clock of the type that is sold for some four or five shillings. The minute-hand had been removed, and the disc of bone firmly fixed in its place. On the edge of this disc was a deep notch, and a pointer was attached, which made the same circuit of the face that the removed hand would have made. At the side of the case was soldered a brass pin projecting forward, and a light bar of wood worked on this pin right across the face, just above the centre; there was a pin at the back of this bar which rested on the bone disc, and, when that disc was in a certain position, would fall into the notch. At the end of the wooden bar was a piece of brass wire, which, when the pin fell into the notch on the disc, was, by the gravity of the bar, brought into contact with the upper spring of a pair projecting from the opposite side of the disc, thereby pressing them together. The springs were attached to a piece of wood screwed to the case, and were tipped with little pieces of platinum wire, which came in contact when the arm pressed the upper spring. The other ends of the springs were attached by wires, one to a two-celled Leclauché battery, and the other to an electric bell, or rather, to the terminals of two bells. The other pole of the battery, and the other terminals of the bells, were attached to the gas-pipe.

The spot to which the pointer was directed when the arm-pin fell into the notch was distinctly marked on the face. To use the instrument for floating or fuming paper, the disc was turned back, say three minutes from the mark referred to, and the arm allowed to drop on the edge of the disc. At the expiration of these three minutes, bells are set ringing close by and in the studio, and continue until the printer turns back the wooden arm. To float a sheet of paper, and then to turn to frames which require filling, or to others outside which require examining, would be a safe procedure, as the bell would give warning of the necessity for attention at the sensitizing-bath. This apparatus, placed at the studio door, would, we can understand, equally well time a lengthened exposure, and give notice of its termination.

The washing of negatives was being effected in a somewhat uncommon fashion. A series of shallow zinc troughs about five inches wide, one and a-half deep, and twenty long, were arranged one above another, forming a sort of zig-zag channel for water to flow down, holes being made in the lower end of each. The plates were placed in these trays, face up, two of their edges resting on the sides, which sloped outwards for the purpose. The negatives were so close to each other that the water, falling in a thick spray upon the first one in the top tray, passed over all in a continuous rapid stream. After a good rinsing under the tap in dark-room, three hours in this apparatus would, we think, be a fair amount of washing.

A propos of the telephone, some of our readers may not know that a recent decision in an American court gives the priority of its invention to one Drawbaugh. "One hundred and forty-five witnesses" have proved him to have perfected a similar telephone to Bell's between the years 1867 and 1876, in which latter year Bell's patent was taken out. Edison's transmitter was also embodied in principle by Drawbaugh's instrument, made ten years before; Reiss' discovery being, however, in front of either. The question is simply: "Was this discovery known in England before 1876?" If so, telephones will be cheaper, and therefore more universally employed by photographers.

Correspondence.

THE ETH-OXYGEN LIGHT.

Dear Sir,—In the News of March 14, page 166, I find a reference to my patent ether light apparatus which is very misleading, and shows that the writer, Mr. Wright, has not used, nor probably even examined, my apparatus. He says:—"The vendors of this generator, in their circular, actually contemplate the blowing off the ends of the generator, and its catching fire, as an event to be by no means unexpected," &c. Now, the fact is, as Mr. Wright may see if he will examine the circular again, it is distinctly stated that such an accident cannot occur unless the operator uses adulterated ether, or otherwise fails to follow the printed instructions. I have been using this apparatus for giving an average of from three to four exhibitions a month for nearly two years, without ever once having the flame retreat into the "saturator." The safety caps, which are an important feature of my apparatus, are there for the benefit of operators who are deceived in the purchase of ether, or who *will not* follow printed instructions until they learn, by ex-

perience, that they must; and the safety caps do actually secure against the possibility of a dangerous explosion. Mr. Wright admits that with other apparatus "there is only one method; and those who cannot depend on themselves never to vary it, are in danger." This alone is sufficient proof of the importance of safety caps or valves of some kind, since experience has demonstrated that a great many operators who will use the lime-light in public cannot be relied upon to exercise the judgment and care necessary to secure against the possibility of accident. Of course, "safety jets" can be used; but if made reliable, it is necessary to use a much greater pressure of gas, and perfect dissolving is, I believe, out of the question with such jets.

Mr. Wright also says:—"Such methods fail to insure saturating the gas, as the supply of ether is apt to prove insufficient at the end." This is true only when an attempt is made to use the saturator for a longer time than it is intended for; and the same objection could be made against any other ether-light apparatus. I have run the saturator two hours, and had the oxygen perfectly saturated with ether to the very last.

I am satisfied that Mr. Wright intended no misrepresentation; but there are some points in the construction of the patent saturator which are not mentioned in the circulars, and it will really do some things which Mr. Wright thinks it will not. In nearly every case where purchasers have had the flame retreat into the saturator, it has been proved either that adulterated ether was used, or that an attempt was made to run it longer than the instructions warranted; and when such slight explosion did occur, no damage whatever resulted. The "explosion" is confined exclusively to the mixture in the tubing, and in the small passage through the centre of the cotton rolls. — Very respectfully yours, Fred. E. Ives.

THE TRICYCLE AND PHOTOGRAPHY.

Sir,—Will you allow me to draw the attention of both amateur and professional photographers, but especially the former, to the great convenience of a tricycle for enabling one to get into the very heart of the country, and so obtain views which otherwise would either be missed altogether, or only obtained at considerable cost?

As an old tricyclist and a two-year-old photographic novice, I can most distinctly give it as my opinion that the two pursuits go most admirably together; in fact, neither is complete without the other.

I, personally, find that a 5 by 4 camera, four backs, tripod, &c., can be carried on a tricycle without the rider being conscious of the additional weight. No doubt a much larger camera could be comfortably carried by a stronger man.

At the same time, as recommending the use of the tricycle, I would point out that there are certain kinds of machines which especially suit the peculiar wants of the photographer, and it is also, unfortunately, my duty to state that there are now machines in the market which are so dangerous in their construction that anyone conversant with the necessary qualities of a tricycle would consider it suicidal policy to mount one. It is necessary, therefore, for anyone contemplating the purchase of an "iron horse" to obtain the advice of an experienced person, otherwise it is not at all improbable that the selected tricycle will turn out to be just what is *not* wanted.—Yours truly,

S. H. R. Salmon.

PHOTO-MICROGRAPHY.

Dear Sir,—Will you allow me, as a photo-micrographer of a few years' experience, to make some remarks on Mr. Allison's paper on "Photo-micrography for Beginners"? He mentions a negative of "Saccharina Lepiscua" (*sic*), and speaks of an enlargement of "one of the animalculæ." Now, I suppose Mr. Allison means *Lepisma Saccharina*, or sugar-runner, an apterous insect, about one-third of an inch in length, belonging to the *Thysanura*; but what does he call "one of the animalculæ"? The scales of *Lepisma* were once used as tests for the highest powers of the microscope, but are now regarded as easy tests for medium powers. They can be easily photographed with an ordinary $\frac{1}{4}$-inch or $\frac{1}{10}$-inch; yet they are hardly "animalculæ!" Surely this must be a printer's error.

As regards the practical part of the paper, an ordinary bellows-camera is far too short for working without the eye-piece; as sharp negatives can be obtained with the eye-piece as without, for the only objection to its use is, that it cuts off too much light with the higher powers. Yet I once obtained a capital photograph of *Gomphonema geminatum* with a $\frac{1}{16}$-inch and eye-piece; the exposure, however, was prolonged. Generally speaking, for real work with powers from $\frac{1}{8}$-inch upwards, a camera of four feet or five feet is not too long.

Focussing can be performed well enough on fine ground glass with powers up to $\frac{1}{4}$-inch, or even higher; but for $\frac{1}{12}$ or $\frac{1}{16}$ I prefer plain glass, and a focussing eye-piece. It is always best to arrange the focussing and illumination before attaching the camera to the microscope. The final focussing can be done afterwards, but the illumination or resolution must be satisfactorily arranged first. It would be difficult, if not impossible, to resolve a diatom for photographing otherwise. Even the expert finds illumination a difficult and delicate task. To pass the rays of light "straight through the whole affair" is certainly simple enough, but would hardly answer where structure is to be shown.

Quarter-plates answer very well for many objects, but with a good lens there is no loss of definition if the image be made to fill a whole-plate. If the lens be strained to give an enlargement really beyond its powers, then certainly the definition will suffer, but not if the lens be up to its work. For beginners, $\frac{1}{4}$-plates are doubtless best, being cheap, for the experienced worker often spoils a plate, and the beginner need not be disappointed if he gets only one good negative out of every dozen plates exposed. I have known experts spoil more than a dozen over a difficult diatom.

Slides need not be expressly prepared for photography. I have photographed many hundred objects, chiefly diatoms, and have never had any slides specially prepared. They may be selected, and, in the case of insect preparations, should always be, as many are so strongly yellow or brown as to be absolutely useless for photography.

Mr. Allison's exposures astonish me. He says: "From ten minutes to two hours." I use powers varying from five inches to $\frac{1}{16}$ inch, and my exposures vary from one second to half an hour, using a broad-wick paraffin lamp. With the $\frac{1}{16}$ inch, and magnesium ribbon as source of light, I find ten seconds to fifteen seconds ample.

As to plates, I find rapid plates are really best, especially with high powers, as yellow light is so inert. Many of my best negatives were taken on Swan's plates marked "30 times collodion," and others on plates prepared by Messrs. Mayfield, of this town, that were even more rapid. Still, using slow plates does not, to my mind, explain Mr. Allison's two hours' exposures.

For development, I once used ferrous oxalate, but discarded it after some months' trial. I have used sulphopyrogallol for the past two years, and desire nothing better. I usually get good density; but in the few cases where a negative turns out too thin, I intensify with mercuric chloride and ammonia. I have negatives thus intensified that were taken four years ago, which have been in the printing-frame frequently, and yet retain a good colour. All photo-micro negatives are somewhat slow in starting when the developer is poured on them, but afterwards proceed as any other negative. However, plates exposed to magnesium light develop as rapidly as plates exposed to daylight. No developer will ever make

anything of an under-exposed plate; the exact worker will destroy all such unsatisfactory results, and try again.

To conclude. Although photo-micrography is spoken of by some as a pleasant amusement, I find it really hard and exhausting work. Taking photographs of easy objects with low powers may be amusement; but after an evening's work with an $\frac{1}{8}$ inch, $\frac{1}{12}$ inch, or $\frac{1}{16}$ inch, one does not feel exactly amused. I confess, after such an evening, to aching bones, exhaustion, and, if all has not gone right, a racking headache. It is work, but, spite of its arduous nature, fascinating work to the enthusiast.—I am, sir, yours faithfully, J. H. Jennings.

THE HISTORY OF PHOTOGRAPHY.

Dear Sir,—In the last number of the Photographic News, Mr. W. E. Debenham asks why, in my table (Photographic News, page 203), I divide the credit for the collodion process between Archer and Fry.

I wrote: "Silver salts in collodion . . . Le Grey (Archer and Fry) 1850," while Hunt in his historical table wrote, "Glass plate collodion, Archer and Fry, 1850." It was Hunt, therefore, who wrote, and not I, that the discovery of the collodion process was due to Archer *and Fry*, 1850. I myself attributed the discovery to Le Grey, although his first formula for collodion was a bad one. Frederick Scott Archer, on the other hand, worked out the process technically in a most perfect manner, and deserves greater credit for its practical introduction; in this respect, without doubt, he deserves greater honour than Fry, although the latter is also mentioned by Hunt. In fact, Hunt, as knowing the English journals of the time, is my guarantee on this point. For this reason I placed the two names together, and mentioned Archer before Fry, although the latter might well have been left out.—Believe me, dear sir, yours very truly, Dr. J. M. Eder.

Vienna, April 14.

A TOURIST CAMERA WANTED.

Dear Sir,—I am in want of a camera particularly suited for tourist work, and being so distant, and without opportunity for inspection and selecting from the makers, I venture to ask you to be good enough to give me your advice as to the camera best suited, in your opinion, for use in a rough country, where lightness and compactness are essential. As to size, I fancy one of about 8 by 5. It is necessary that every part should be compact, and fit perfectly in a waterproof or leather case.

You will perhaps remember my name in connection with some rocky mountain views lately sent you. The camera with which I took those is much too heavy for an exploring expedition on which I shall shortly start, and I wish to provide myself with one better adapted for mountainous work. I trust that you will give me what assistance you can, and I shall have pleasure in sending you specimens of my work on returning.—Yours faithfully, James R. Waghorn.

Land Department, Canadian Pacific Railway Company,
March 28, 1884. *Winnipeg.*

[The best thing we can do for Mr. Waghorn is to print his note.—Ed. P.N.]

A NEW ADAPTATION OF THE IVES' METHOD AND OF EGGIS' CRAYONOTYPE PROCESS.

Sir,—Some experiments which I have made with the above processes have led me to to the discovery of a simple modification, and, like Mr. Eggis, I would rather publish my discovery than that it should become the subject of a patent, and stand as a hindrance in the way of photographic progress. Ives, it will be remembered, takes an impression from an inked photographic relief on a grained paper, and this serves as a transfer or mother print; while Eggis, instead of inking the relief, interposes between the relief and the grained paper a film which is inked.

Now I have found that excellent impressions can be obtained upon a grained stone (lithographic) or upon a grained zinc plate, by inking the relief and pressing it against the rough stone or the zinc, while by adopting the Eggis method of the intermediate inked film, I can in many cases work with greater ease. I use for the Eggis modification gold-beater's skin inked on one side. The relief may either be developed on a rigid surface such as a metal plate or a slab of thick glass, or it may be used in film form; but in the latter case it is sometimes well to place one or more thicknesses of paper behind it to give softness. Your readers will find particulars of the Eggis process on page 789 of your last volume, and on page 130 of your present volume, and the novelty I claim is the use of a grained stone or zinc instead of the grained paper. Of course, either stone or zinc may be etched into relief by well-known methods, and either a swelled gelatine relief or a Woodburytype relief may be used. I enclose a print.—Yours truly, John E. Philbrick.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 10th inst., Mr. A. Mackie in the chair.

Mr. H. E. Moule had recently photographed a distant view at night, illuminated only by flashes of lightning occurring during an hour's exposure. Although the distance was very well shown, little or no detail was visible in the foreground.

Mr. W. E. Debenham, referring to his remarks at the previous meeting on Capt. Abney's precipitation process, said he made a batch that morning. The negative now shown was coated one hour and a-half after weighing out the chemicals; perhaps the member who was searching for slow plates would be good enough to give these a trial. Thirty grains of silver was employed; no iodide was used.

Mr. A. Cowan: What exposure did this plate receive?

Mr. Debenham: Twenty seconds on one half, and forty seconds on the other; No. 2 stop, about equal to $\frac{f}{6}$ of the universal system; both were under-exposed. Plates may be made quicker by this process if the digestion is longer, but there would be risk of fog. He mixed at 120° F., and left it an hour, when the temperature would be about 100° F. Mr. Debenham then went through the manipulations of making the emulsion, contending that all the silver was precipitated, and using less than half a grain of gelatine. The liquid was not clear on the first washing, but clear on the second. The finer particles of bromide would go down if left long enough.

The Chairman said Mr. Debenham had carried out all he said he could do, and he should like to hear a few remarks from others experienced in precipitating methods.

Mr. A. L. Henderson took exception to Mr. Debenham using acid. By using concentrated solutions, he (Mr. Henderson) could precipitate bromide of silver in large flakes, leaving a perfectly clear solution. He believed Mr. Stebbing first pointed out the method, a fine emulsion being obtained immediately, as a member present could testify.

Mr. C. H. Cooke corroborated.

Mr. Cowan: Was Mr. Henderson's clearer than this?

Mr. Cooke: Yes.

Mr. Henderson: Neither acid, gelatine, nor chloride was used. He then showed a new form of dark-room lantern, made from a plate-box. The grooves contained plates coated by Ihlee and Horne with phosphorescent paint, also plates of aurine, cathedral green, and ground-glass; a small paraffine lamp placed behind the various media, and a square aperture cut in front, completed the arrangement. Plates giving 18 on the sensitometer were exposed two, four, and six minutes respectively to the light passing through the following:—One phosphorescent plate and two of aurine, an image being obtained in each case six inches from the box. Two phosphorescent plates, and two of aurine, a six minute exposure having no effect. Two phosphorescent plates, no effect 18 inches from the box, sufficient light to see the hands of a watch nine feet away. One phosphorescent plate, two

aurine, and one cathedral green, six inches from the lamp, gave a very slight indication. Two phosphorescent plates, two aurine, one cathedral green, no indication at six inches distance.

The Chairman considered the phosphorescent plates stopped the large amount of actinic rays.

Mr. Cowan thought the rays were stopped by absorption.

A discussion followed on the value of certain rays in exciting a phosphorescent tablet, and why that plate farthest from the light was not phosphorescent, yet permitting rays to pass through which were safe for developing purposes. It was thought that the light was sufficient only to sensitize the plate nearest the flame. Sensitizing with a weak light and de-sensitizing with another colour, was said to have some bearing on the subject. The effect of passing violet rays into a solution of quinine was given as an example, fluorescence being obtained in one cell, but none in the second; and in reply to a question from the Chairman, Mr. Haddon mentioned violet rays as having the greatest sensitizing action on luminous paint.

Edinburgh Photographic Society.

The sixth meeting of this Session was held in 5, St Andrew Square, on April 2nd, Mr. Wm. Neilson in the chair.

The minutes being passed, the following gentlemen were unanimously elected ordinary members:—Messrs. Archibald Brown, John M'Laren, J. Keith Chisholm, David Munro, and Thomas Young.

Mr. Craig Christie moved that the Secretary be instructed to insert in the minutes expression of the sincere regret at the death of His Royal Highness the Duke of Albany, and that he prepare addresses of condolence to Her Majesty and the Duchess of Albany, to be signed in the name of the Society by the President, Vice-Presidents, and Secretary. This was passed without dissent.

Mr. Craig Christie moved that the following be added to the rules of the Society:—"That the Secretary shall call Council meetings after consultation with the President, and that he shall give three days' notice to members."

The Secretary said that he had no objection to the proposal, save that it did occasionally happen that some matter of importance cropped up which necessitated prompt action, and when such was the case it might be greatly to the disadvantage of the Society if a delay of four or five days were made obligatory. He suggested that as the Council were about to revise the rules, this matter might be referred to the Council. This was agreed to.

The Secretary then intimated that he had been favoured with two important papers by the Rev. Mr. Hardwich and Mr. Lewis Wright respectively, and proposed that the programme be departed from in order that these papers might receive the earliest publicity. Mr. G. G. Mitchell had courteously acceded to this, and proposed reading his paper at the next meeting, subject to the will of the meeting.

The proposal having been passed by acclamation, a paper by Mr. Hardwich, entitled "Notes on the Lime-light," was read by the Secretary, and immediately after, Notes on the same paper by Mr. Lewis Wright (see pp. 230 and 231).

Mr. J. M. Turnbull said that with one or two exceptions he agreed entirely with everything that Mr. Hardwich had said in his paper. He thought that the proper angle for the burning gases to strike the lime cylinder should be the greatest that could be given, without giving a shadow on the screen, *i.e.*, as near a right angle as possible. He agreed with Mr. Hardwich that "light for all ordinary purposes could be got with ¾ to 1 cwt. on each bag"; but where the very best light is wanted to fill a 20 ft. screen, he believed in having plenty of pressure. Square weights ought always to be used, or still better, a long flat-sided weight cast for the purpose, in shape like a piece of pig metal. With regard to the ether generator, he had used it many times with convenience to himself, and believed it was quite capable of giving a light equal to the mixed gases. He thought it quite safe in competent hands, but it should not be trusted in the hands of those who were beginners, or who had only a slight knowledge of what they were doing. In making experiments with the generator packed in ice, Mr. Hardwich did not seem to be aware that all properly made ether generators are jacketed or encased in a thick coating of some non-conductor of heat, such as cork raspings or sawdust, and subsequently not easily affected by cold, or by a little heat such as that of a crowded room. With regard to the Chadderton accident, he quite agreed with the opinion of Mr. Hardwich, Mr. Wright, and the published opinion of Mr. Broughton, that the cause of the explosion was that there was ether in the bag. He thought Mr. Wright's suggestion to open the hyrogen tap of the generator first to relieve any pressure a most valuable one. He did not think Mr. Wright's first objection to ether, viz., want of saturation, a serious one, as he had proved to his own satisfaction that either air or oxygen could be very easily saturated with ether to make them burn freely; but the second objection (that of back-pressure) was one that would require to be seriously met and remedied either by the construction of a generator that could be blown back without sending the ether back through the tubes, or by interposing some thoroughly tried safety contrivance. He had very little faith in back pressure valves, &c., and the newly-suggested pumice chambers would require to be thoroughly tested before they could be said to be safe.

Mr. Hume said, with regard to the preparation of the oxygen, he did not find it necessary to weigh the ingredients; but when making the gas himself, he simply blackened the chlorate with the manganese dioxide. When once the flow of gas begins, the heat should be kept low, for a kind of fusee action goes on in the mixture till all the oxygen comes off regularly if a moderate heat is kept up below the retort. It is of the greatest importance that the tube leading from the retort be ranged out with a stout spiral wire each time the gas is made, for so much solid matter is carried over that it would ultimately choke the pipe if neglected after several makings, and to this cause he attributed some of the accidents that had happened. For those who suspect black materials like manganese dioxide, and do not feel sure of the tests for it, he mentioned that red oxide of iron would suit quite as well; indeed, it was much preferred in some chemical laboratories, as giving the gas more free from chlorous compounds. Common sea-sand would also help to give a steady flow of oxygen when mixed with the potass chlorate. He had used the mixing burner he exhibited very frequently for the past five or six years with oxygen and coal-gas in separate bags under one hundredweight pressure each, without any approach to a casualty; indeed, he considered it the safest arrangement that could be used. The mixing chamber in this burner has no packing whatever. It is not desirable or safe that the weights should fall off the bags; but the last time he gave an exhibition in this room, one of the weights fell off the oxygen bag without anything going wrong except the diminution of light, and all went right when his assistant replaced the weight. On former occasions, too, while the light was burning, he had lifted weights off and put them on again without any accident or even a snap.

Mr. G. A. Wilson said, with reference to the pumice safety-chamber, his objection to it was that, after being repeatedly used or knocked about, some of it was apt to get pulverized and blown into the nozzle of the burner, and so choke it up. The only safety-chamber he used was a common piece of cane inserted in the tubing near the burner. Through this no light will pass, no matter what the composition of gases may be, and no dust will pass from it into the burner. The diameter and length will depend upon the pressure available or necessary. He had found, with 1 cwt. on the bags, a piece of cane ½ inch in diameter and 1 inch or 1½ inch long, thoroughly efficient. If a piece of cane such as he described were attached to each burner, he had not found it possible that an accident could occur, no matter what suction takes place by the weights falling off, or in whatsoever proportion the gases are mixed, because they will not explode without a light, and the light is stopped at the cane. With reference to the ethoxo lime light, he considered it safe so long as kept burning sufficiently to make the lime incandescent; but the moment it is turned down with the tap for the purpose of dissolving with a double lantern, it becomes dangerous. He thought the danger due to the dissolving tap being at a considerable distance from the ether generator, and the intervening tube became filled with oxygen gas saturated with ether, and as the little escaping, or rather burning, at the nozzle is not issuing at high pressure, the flame rushes back as soon as the dissolving tap is turned on. Some lanternists held that it was not possible for the flame to travel along tubing; but he maintained that such was not only possible, but certain when using the mixed burner if the weights should fall off the hydrogen bag, causing a suction of oxygen gas into the hydrogen bag. It was an undoubted fact that bags sometimes catch fire when the weights fall off, and this he believed might account for it. With reference to the lantern microscope, he had also been giving his attention to it, and had succeeded in showing a flea (the object, not the dise), six to twelve feet in size, clear and distinct on the screen, by using a specially constructed lens of wide aperture and high power.

Hearty votes of thanks were accorded to Mr. Hardwich and Mr. Lewis Wright for their valuable papers.

A vote of thanks to the Chairman terminated the proceedings.

Glasgow and West of Scotland Amateur Photographic Association.

The usual monthly meeting of the above Society was held in the Religious Institution Rooms on Tuesday, the 8th inst., Mr. Hugh Reid (President) in the chair.

The following new members were admitted:—Messrs. H. Gillespie, R. T. Cochrane, Jas. S. Stewart, Jas. Bell, Chas. S. Mair, Wm. France, and Wm. Reid.

Mr. J. Y. McLellan then exhibited and explained Warnerke's sensitometer. Mr. McLellan, however, did not consider it altogether satisfactory, as from his observations it tended to deteriorate with age. Plates which he found of the same rapidity in practice last year gave the number 20 quite distinctly, this year only gave a little over 14.

Mr. Goodwin suggested that temperature had a great effect on these phosphorescent tablets, and the discussion was continued by Messrs. Lang, Reid, and others. Of the two plates tested by Mr. McLellan both out of the same batch, one exhibited the number 14, and the other only 10. The plate exhibiting 14 had previously been treated by the President with Dr. Eder's formula for rendering plates more sensitive viz.:—

Nitrate of silver...	50 grains
Citric acid	50 ,,
Water	1 ounce

Plates soaked for three minutes in one drachm of this solution to twelve ounces of alcohol. This showed an increase of sensitiveness in the ratio of three to one, which corresponds with Dr. Eder's results.

Mr. W. C. Bergins then exhibited his novel form of portable tourist camera, and in the course of a few introductory remarks said that a really portable tourist camera which would unite all the qualities of a studio camera, an enlarging camera, and a landscape camera, was as impossible as a horse which would combine all the qualities of a race-horse, a Clydesdale, and a Shetland pony. His aim in designing this camera had been extreme lightness as well as the necessary strength. In showing the camera, which had been made throughout from his own designs and under his own superintendance, Mr. Bergins pointed out that it was a whole-plate solid camera made so that the four sides, two fronts, two lenses, and all other necessary apparatus were carried inside. The principal points were extreme lightness, his whole apparatus, carrying seven plates, weighing only eleven and a-half pounds, very small bulk; and although the camera was made solid, it would focus from 5" to 11" by putting the slides nearer to or more distant from the front, the exact focus being attained by rack-and-pinion lenses. The tripod was made of bamboo cane, going up like a walking stick, and when a silk cover was drawn over, had the exact appearance of an old-fashioned umbrella.

While the members were examining and admiring Mr. Bergins' camera, he kindly answered a great many questions regarding it.

Mr. W. Goodwin then read a short lecturette, and gave a demonstration of photo-micrography (see page 245).

The meeting was very much pleased with Mr. Goodwin's deftness of hand, and with his extremely clear method of working; and doubtless many will now go in for this branch of photography.

The President then showed a camera-finder and view-meter which he had got made at a trifling cost according to the directions in the Year-Book for 1884. The meeting considered both very useful, especially the view-meter.

It was agreed, after a little discussion, that the first out-door meeting of the season should be held on the first Monday in May, that the place be "Brig o' Turk and Trossachs," and that members leave Glasgow by the 6.50 or 9 a.m. trains.

After the usual votes of thanks, a very large and successful meeting adjourned.

Newcastle-on-Tyne and Northern Counties' Photographic Association.

The ordinary meeting of this Association was held in the Patent Room of the Literary and Philosophical Society's Institute, on the 9th instant, Colonel Sheppee in the chair.

The minutes having been confirmed,

Mr. W. C. Fletcher was nominated for membership, and Messrs. J. H. Inness, F. W. Morgan, J. Russell, and A. Ross were duly elected members.

A report from the Council with reference to the exhibition and to out-door meetings was adopted unanimously. It contained recommendations from the Council as follows:—That no open competition be held this year. That a private exhibition of members' work be held in the autumn, at which a print be selected for exhibition to members, the print selected not to be smaller than half-plate, nor larger than 10 by 8. The members to be the judges.

The following offers, by gentlemen members of the Association, had been accepted with thanks:—Mr. George Borrow: A silver medal for the best set of three pictures taken by a member at the Society's out-door meetings this year. Mr. J. P. Gibson: A prize for the two best pictures taken at the Society's out-door meetings this year, the successful competitor not to have previously received a medal or diploma. Mr. J. A. Maling: A silver medal for the best set of three transparencies taken by a member.

The meeting then adjourned to the adjoining lecture theatre, where

Mr. J. P. Gibson gave an interesting lecture on "Landscape Photography for Amateurs" (see page 246), for which a hearty vote of thanks was passed.

Mr. Allison, assisted by the Hon. Secretary, then proceeded with the lantern exhibition. Some beautiful slides were shown, and much appreciated. The best thanks of the Association are due to Mr. Allison for his kindness in bringing his lantern, superintending the arrangements therewith, and for the loan of a very fine set of Egyptian slides. Also to Messrs. York and Son, and Messrs. Watson and Sons, of London; Messrs. Mawson and Swan, Morgan, and Mr. J. F. Maling, of Newcastle; and Mr. J. Hedley Robinson, of Tonemount, for contributions of slides.

The Hon. Secretary read a communication he had received from the Rev. T. F. Hardwich, in the course of which that gentleman said:—

"I speak advisedly when I say that nine out of every ten accidents at lantern exhibitions with the oxy-hydrogen or eth-oxo lime-light are due to a sudden stoppage of the pressure by which the two gases are forced forwards, and to a return of one of the gases in the wrong direction. A lecturer using the lime light should examine his tubing with the same care that the coal-miner examines his ropes; and, if the exhibition is likely to be a crowded one, he should put on a back-pressure valve to secure himself against a return current of gas. If some photographic society were to offer a prize for the valve and tube most free in action and least liable to get out of order, the ingenuity of mechanicians would soon supply the want. It must be borne in mind that back-pressure valves are intended to stop gas, and not flame; whereas safety-tubes are meant to stop flame, but not gas. My own experiments, so far, seem to indicate that an effectual safety-tube can be made without any difficulty, when it is protected from suction or forcing by the addition of a suitable valve. In my own practice I have seldom used these appliances; but if I be spared to see another winter I shall, when lecturing away from home, employ the blow-through or safety jet, if practicable."

Talk in the Studio.

Balloon Photography.—It is not "all honey," apparently, in ballooning, for thus says our friend Mr. Shadbolt:—"Balloon photography impossible on Monday last at Birmingham—blowing half a gale—badly knocked about, both starting and landing—worst experience ever had. No bones broken, but much shaken and stiff about the arms and shoulders. Camera-holder (not camera itself, luckily) smashed off before we even got clear. Landed at Worcester—travelled between thirty and forty miles an hour.—Cecil V. Shadbolt."

Messrs. Wratten and Wainwright are good enough to forward us four instantaneous views of the boat race; they illustrate "Clearing the Course," "The Race," "Steamers Following," and "After the Race."

Instantaneous Views of the Funeral of the Duke of Albany.—Mr. G. P. Cartland sends us a series of six half-plate pictures which he secured on the 4th instant at Windsor, while the funeral procession was passing. The best of the series are

the Queen's carriage, drawn by six white horses, and the gun-carriage upon which the coffin was borne. As the exposures were extremely short (estimated at one-sixtieth of a second), no signs of movement are obvious, and the detail is all that could be wished for. We understand that the Queen has expressed much satisfaction with Mr. Cartland's work.

Non-Influence of an Electric Current upon Light.—Dr. Lecher has made an experiment of great interest. A ray of light was divided, as in many experiments on interference, into two parts, which, after passing through two parallel glass troughs, were caused to reunite, giving the usual interference-bands. The troughs contained strong solutions of nitrate of silver. By means of electrodes of silver an electric current of 6 amperes strength was carried in opposite directions along the troughs, so that in one trough the current flowed with the light, and in the other against it. But in no case was any displacement of the fringes observed. Dr. Lecher concludes that the velocity of light is not influenced by a current flowing through the medium.—*Nature.*

Chemical Action of Light; Decomposition of Oxalic Acid by Ferric Chloride.—By G. Lemoine (*Compt. Rend.*, 97, 1208—1212).—Solutions of ferric chloride and oxalate acid containing a gram-molecule of the respective substances per litre were mixed in different proportions and exposed to light under comparable conditions, the carbonic anhydride which was given off being collected over glycerol and measured. Decomposition takes place in accordance with the equation $Fe_2Cl_6 + H_2C_2O_4 = 2FeCl_2 + 2HCl + 2CO_2$ (Marchand; Jodin). The rate at which decomposition takes place depends on the intensity of the light. For a given intensity, it is at first almost uniform, but when about half the total quantity of carbonic anhydride has been given off, the rate of decomposition gradually diminishes. The greater the volume of the liquid, the longer, of course, is the time before decomposition slackens. When the two solutions are separately exposed to light for several hours and then mixed, decomposition takes place more rapidly than if the solutions had not been previously insolated. Other conditions being equal, dilution with water increases the rate of change, an effect which may be due either to the partial decomposition of the ferric chloride by the water, or to a diminution in the absorptive effect of the ferric chloride due to dilution. When ferric chloride is in excess, less gas is given off than when the two substances are present in equivalent proportions; a similar effect is produced by adding ferrous chloride to the mixed solution. An excess of oxalic acid exerts an effect similar to that produced by dilution. Water exerts little or no absorptive effect on the waves which bring about the reaction, but a screen of ferric chloride solution almost entirely prevents the decomposition.—*Journal of the Chemical Society.*

Photographic Club.—At the next meeting, on April 23rd, the subject for discussion will be "On Lighting in Landscape Photography."

To Correspondents.

*** We cannot undertake to return rejected communications.

Russell Steele.—You cannot do better than to adopt the combination of orange glass and ground glass, as recommended by us on page 50 of the present volume. See also page 61.

J. E. H.—We have tried the process to which you refer, and find it by no means so well adapted for the work as the new method of Pavloffski, described on p. 194. The carbon process may answer, but you will require a tissue rich in pigment, and consequently containing but a moderate proportion of gelatine.

Albert.—1. When it is stated that the specific gravity is ·9228, it is meant that if a volume of the alcohol equal to that of one unit of water (say one pound) be taken, the alcohol will weigh ·9228 of a pound. 2. The first should be read 27 and 4-10ths, while the second is read 13 and 7-10ths. The first figure to the right of the decimal point indicates tenths, the second hundredths, the third thousandths, and so on. Thus, ·9228 is something over 9-10ths, or $\frac{9228}{10000}$.

A. Brown.—The etching ground (such as is used for ordinary plate work) can be obtained in the solid or the liquid form from M. Cornelissen, Artists' Colourman, Great Queen Street, London, W.C. If you obtain it in solid form, it should be dissolved in oil of lavender.

R. W. Taut.—Unless we have misunderstood you, this is a very bad case of piracy. If you prosecute, and the pirate is sentenced to a term of imprisonment, he may modify his view as to his *right* to appropriate your property. 2. You had better take proceedings against the vendor, but you should purchase from the printer if possible. Let us know how you get on.

John G. M.—Some years ago we used a tricycle of the make known as "Coventry" with perfect success for out-door work, but we can hardly give a decided opinion as to which is the best. You must of course consider your individual requirements.

Geo. Mackie.—1. It does not matter at all in ordinary cases, as the citric acid will render it strongly acid; but in most instances you will find that commercial samples possess a very feeble alkaline reaction. 2. In such a case there is something decidedly wrong, and a preparation so decidedly alkaline should not be sold. You had better return it, ask for another sample, and demand from the dealer as much pyrogallic acid as you have wasted.

J. M. K.—The actinic power of the light varies very much indeed, and sometimes when a yellowish tint pervades the atmosphere the exposure required is enormously greater than on an average day. Indeed, assuming the first day you mention to have been a decidedly unfavourable one, we see nothing surprising in your experiences.

C. Sutton.—Transfer a collotypic impression to the wood. You will find full directions on page 402 of our volume for 1883.

Gilbert Wilson.—We have never used such an ink, but have no doubt that a satisfactory preparation may be made as follows:—Mix clear solutions of barium chloride and sodium sulphate, and wash the precipitate which is thrown down by stirring it in a large quantity of water, allowing it to settle, and pouring off the clear liquid. The remainder should be thickened with a little gum.

M. Wills.—It may be kept for any length of time if perfectly protected against contact with the air, but if exposed to the atmosphere it soon becomes oxidized, and consequently useless.

M. W.—1. You can obtain it from Johnson and Cumbers, Lithographic material warehouse, Farringdon Street, near the Viaduct. You should ask for it "uncoated," or they may serve you with a transfer paper made on material you require. 2. Thank you for your kind offer, which we we will bear in mind.

R. Harcourt.—1. It is very probable that the paper is made from wood pulp, as such paper ordinarily becomes first yellowish and ultimately brown under the influence of light. It is, however, not the actual fibre, but the incrusting matter, which undergoes the alteration, and it is quite possible to so far purify the wood pulp as to obtain a paper which will stand the action of light as well as that made from rags. A dilute solution of acid hydrochlorate of aniline will serve as a rough test for the incrusting matter, as it stains the imperfectly purified wood paper bright yellow. To prepare the solution, you may dissolve a drachm of aniline in a mixture of half-an-ounce of hydrochloric acid and five ounces of water. 2. We do not understand your question, but if you will explain what you mean by "a solution of uranate," we may be able to comprehend your meaning. 3. Add a solution of chrome alum (30 grains to the ounce) drop by drop until the gelatinous solution shows signs of thickening or coagulation, and then add sufficient acetic acid to bring it back to a state of complete fluidity. 4. Probably you will be able to obtain a sufficiently good cast with sulphur or the so-called Spence metal; but in melting the sulphur you must take care that no portion is heated much above its melting point, as otherwise it will become thick and viscous. 5. Ordinary washing soda will answer.

The Photographic News Registry.

Employment Wanted.

Recep.-Room, &c., at 18/- for permanency.—E. H. H., *Photo. News* Office.
Retoucher, can tint.—Miss Cross, Hill-st., Peckham.
Operator, can retouch, enlarge, print, manage.—X., 115, High-st, N.W.
Printer or Gen. Assist.—J. A. Randall, The Bazaar, Broadstairs, Kent.
Retoucher, Artist, &c.—W. Rubers, 28, Pond pl., S. Kensington.
Operator & Retoucher.—A. D. Thissack, 1, Woodside-ter., Douglas, I. of M.
Retoucher (German), first-class.—30, Stean-st., Haggerston.
Assistant, well up in dry plates.—Photo., 148, St. James'-rd., Holloway.
General Assistant.—Z., Mr. Gregory, High-st., Marboro'.
Printer and Toner.—F. Knight, 40, Brooksby-st., Liverpool-rd., N.
Reception Room Lady in Lond.—M. A. S., 17, The Drapery, Northampton.
Operator & Retouch., first-class.—W. H. H., Art Studio, 3, Cheapside, E.C.
Operator & Ret., mod. salary.—Operator, 58, Campden-st., Kensington, W.
Photo. Colourist, gen. useful.—G. Manton, 49, Hurley-rd., Kennington-la.
Operator & Ret. in good house.—D. Prodger, The Broadway, Ealing, W.
Operator and Retoucher, could manage.—Artist, 1, Hove-st., W. Brighton,
Youth, as Assistant in dark room.—H. Eckhardt, 12, Bath-st., Brighton.

Employment Offered.

Operator, good, at once.—C. K., 96, Bath-st., Glasgow.
Printer, first-class, immediately.—Hills & Saunders, Aldershot.
Recep.-Room Lady for Brighton.—C. H., Clermont, Preston-pk, Brighton.
Operator, who can retouch, for month.—Norman May, Malvern.
Assistant in Stock-dealer's Warehouse.—Ruby, *Photo News* Office.
Oper., clever with children & retouching.—Clayton, 6, Lond.-rd., Leicester.
Printer, with first-class references.—Stiles, 8, Kensington High-st., W.
Operator, Retoucher, manage branch.—C. Keeping, 1, Exe-bridge, Exeter.
Out-door Operator, first-class.—Taylor, 70, Queen Victoria-st., E.C.
Operator for Studio.—Hills and Saunders, Eton, Bucks.
Ferro Oper., to travel.—Mr. Griffith, 5, Northampton-bldgs, Clerkenwell.
Lady, exp., Recep.-room.—Hughes & Mullins, Regina House, Ryde, I.W.
Printer, well up in vignetting.—Winter, Midland-rd., Derby.
Oper. & Retoucher, good at lighting & pos.—Shrubsole, Davy-pl. Norwich.
Printer & Gen. Assist.—E. R. Gyde, Cheltenham House, Aberystwith.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

THE IVES PROCESS FOR MAKING PHOTO-TINT BLOCKS.

Now that the production of phototypic blocks from the ordinary gradated negative has become a matter of almost every-day practice, and such blocks are coming into general use as a means of magazine and book illustrations, every advance in the methods of production becomes of great interest, and we are pleased to be able to publish some of the details of the latest method devised by Mr. Fred. E. Ives, of Philadelphia. We need do no more than refer to the old form of the Ives process, in which a gelatine relief is inked with printer's ink, and an impression is taken on a sheet of grained paper; the gradation of the print being produced by the more or less complete crushing down of the grain of the paper by the inked relief, and the print thus produced being either re-photographed or used as a transfer.

Mr. Ives has recently much improved his method, as he now takes a cast in plaster from the relief, and impresses an inked stipple on this by means of an elastic stamp. Under these circumstances the grains of ink unite to solid blacks where the relief is highest and the pressure greatest; while in the deeper portions of the cast the spots of ink deposited from the elastic stamp are extremely minute. The next problem is to obtain a transfer from the inked plaster without re-photographing it in the camera. And as regards this point, we can quote Mr. Ives' own words under date November 7th, 1883. He says:—

"I no longer reproduce the impression on the plaster relief by photography in the camera. I have this improved method in regular and perfectly successful operation now, and will describe it to you. After making the impression on the plaster relief, I flow it with plain collodion, which penetrates the ink, but does not make it 'run.' When dry, I wet it with a solution of gelatine in acidified water, then strip it off, and make a negative by contact printing on a collodio-bromide dry plate. Negatives can be made much quicker and better this way; and by reversing the stripped image I avoid the necessity for making a reversed negative. We can also preserve the stripped picture in a book, so as to make new plates whenever they may be required.

"The plaster reliefs which I make (from swelled gelatine) do not preserve their surface for more than a week or two, becoming 'frosted' on the surface after a certain amount of exposure to a moist atmosphere. For this reason, I cannot well send you one for examination; but I enclose in this letter one of the stripped 'impressions' from which my negatives are now produced.

"The entire process, as now operated, is very simple and reliable, all minor difficulties having been overcome by patient experiment."

Quite recently further progress has been made, and the necessity for the production of a contact negative from the stripped transfer has been obviated, Mr. Ives having found that a fatty transfer or impression can be conveyed from surface to surface (as from the plaster to stone or to zinc) without the spreading which results when paper is used. Once more we may quote Mr. Ives' own words (under date April 7, 1884):—

"You may remember that I told you, some time ago, I had succeeded in transferring the inked impression from the plaster relief to stone or zinc, but that I did not practise that method because I could get better results by 'photo-engraving' from contact negatives of the impression stripped by means of a collodion film. I found the latter method a great improvement upon photographing in the camera, but I now do much better than that. I temporarily abandoned the transfer method because the ink spread or 'smeared' in transferring just enough to seriously affect the result.

"Learning later that sheet rubber could be employed for transferring, and that it would take and give a sharp impression when paper would not, it occurred to me that it might be just what I required, especially as the rubber would follow the uneven surface of the relief better than paper. So I have experimented with it until I am now able to put a perfect transfer upon zinc or stone within five minutes after the impression on the plaster-relief is made. This greatly simplifies the process."

Mr. Ives promises shortly to send us an example of his latest work, in which the improvements to which we have referred will be embodied.

Information as to the Ives' process will be found in our volume for 1883, pages 498, 677, and 739; also in the present volume, pages 130 and 253.

ON THE CHARACTER OF LIGHT REFLECTED BY GREEN FOLIAGE, AND ITS REPRODUCTION IN PHOTOGRAPHY.

THE colour in which trees and shrubs appear to us is never actually green, though to the eye foliage may be verdant enough; and if a photograph is to be taken to reproduce in their true intensity the light and shadows upon foliage, it will be necessary to have a film specially sensitive to the colours presented to it. The problem is not a new one, as everybody knows, and as long ago as 1842, the attention of that eminent French chemist, the late M. Dumas, was called to it; while again, in 1854, we find the subject once more receiving the attention of Helmholtz. Both of these authorities were of opinion that the light reflected by green leaves was bereft of chemical rays, from the circumstance that these particular rays were absorbed by the plant to do a certain amount of chemical work. Later on, indeed, Roscoe, as also August Vogel, demonstrated the fact that very few rays, capable of acting upon silver salts, could get through green leaves.

Very little has been known about the character of the light that is reflected by green foliage. Recently, however,

Lommel, and still more lately, Reinke, have made an investigation of the matter, and they have found that this reflected green light is composed of rays similar in all respects to light that has been transmitted through a single leaf. In a word, the green-reflected light consists of rays of extreme red, say before B in the spectrum, and of rays between C and E—that is, of orange, yellow, and light green. There are also weak rays of dark green and blue present. The absorption spectrum of chlorophyll is seen to advantage in a spectroscopic examination of this green-reflected light.

The reason why this light reflected by green foliage, and which consists, as we have said, for the most part, of red and green rays, seems to us only green, and nothing more, is explained by Reinke; he says that red rays are far less appreciated by the retina of the eye than the green, and hence it is as we said at the outset, that the real colour (to speak phys'ically) of leaves and foliage, as we see it, is never green.

The sensitive plate does not, however, behave like the retina of the eye. We have had many examples of this, and we know full well that the photographic plate will take notice of things that are unseen by the eye. The reasoning upon Lommel and Reinke's experiments would go to prove that, for practical landscape photography, it would be well to employ a film, if it can be had, that is particularly sensitive to yellow-green, yellow, and orange rays. Eosine-stained bromide plates answer the purpose to a slight extent, but their sensitiveness in this respect requires to be more exalted than that usually found in these films. Dr. Vogel seems to have made a stride in the proper direction, for he undoubtedly has obtained films more sensitive to the yellow and yellow-green than to the blue; but, unfortunately, he has told us nothing as yet of his mode of preparation. Still, from indications that come to us from more sides than one, there seems a good chance that the hopes of Herrn Lommel and Rienke will be fulfilled, and that a sensitive film, fit to photograph foliage, will soon be forthcoming.

PHOTOGRAPHIC OPTICS.

At a recent meeting of the London and Provincial Photographic Association, Mr. W. E. Debenham lectured on the subject of photographic lenses. The lecture itself will be found in our columns. The discussion which followed was very instructive in several respects.

For instance, the remarks made by Mr. Cadett were particularly worthy of notice. He was speaking of the different opinions which are expressed as to the powers of different lenses, and he pointed out that the possible qualities of a lens ought not to be a matter of opinion at all, but that it ought to be possible to say, "A lens ground with such and such curves, and having glass used of such and such densities, is capable of giving this certain amount of definition (or, more strictly speaking, want of absolute definition), for a central pencil, will have exactly so much curvature of field, and will exhibit so much astigmatism." He pointed out that it is merely a matter of correct data and sufficient mathematical skill, and these things may be worked out definitely and absolutely for a given lens—the assumption, of course, being in such a case that the grinding of the glass is absolutely correct.

Mr. Cadett had himself gone through a course of optical mathematics which would have enabled him to perform the necessary calculations, but he had found it impossible to get the required data. Thus, opticians do not inform the purchasers of lenses either to what radii the surfaces of glass are ground, nor do they tell them what is the density of the glass; and, as a matter of fact, Mr. Cadett had found his labour of acquiring this necessary optical mathematics so much work thrown away.

Mr. Warnerke had, it appears, also gone through a similar course of mathematics with the view of enabling himself to judge of the capabilities of various lenses, but after all, came to the conclusion that the best means of judging of a lens was to fix it to the camera, to take a photograph with it, and to judge from that.

In spite of this, there can be no absolute impossibility of doing what Mr. Cadett recommends. It would be quite possible, were any one of sufficient capacity to take the work in hand, to have it stated of any lens, what is the utmost that it is capable of doing; but it must be borne in mind that the statement would only be one of what the lens *might* do, not necessarily of what it *would* do, because it involves an assumption of perfect workmanship. Thus, of a portrait lens it might be said, "A central pencil of light will focus into a disc of ·001 inch diameter:" but this would only mean that this was the smallest possible disc which might represent a point in the object; that is to say, nothing *better* than this could be expected, something *worse* might. Nor is it to be supposed that, as a rule, lenses even by the best makers give results so near the theoretical ones that the errors due to defects of workmanship can be entirely disregarded.

The curves of a photographic lens are, as a rule, worked out mathematically to begin with, and every lens which was perfectly ground would give a certain ascertained result, and every one would give the same result as another made according to the same formula; but, as a matter of fact, we know that in the case of the lenses turned out by our very best opticians there is considerable difference of quality. This is especially the case when we come to lenses of long focus and large diameters. In such cases, if we take two similar lenses, and examine the central definition under a high power eyepiece, we shall often find great difference between the one and the other.

In spite of all this, such a work as Mr. Cadett suggests would be a most valuable one, and we look to see it undertaken some day. The labour would be excessive, however. We were a little while ago talking to an optician in connection with whose firm there works a most eminent optical mathematician. It came under discussion whether it might not be possible to make a lens uniting certain qualities not found in any one photographic lens at the present time. The mathematician in question had, our friend informed us, told him that in his opinion it was possible, but that the working out of the mathematical problem would be a thing involving several months' hard work!

Although the calculations involved in discovering the defining quality, the curvatures of field, and the amount of astigmatism given by any lens are most difficult and complicated, there are some facts concerning lenses which are so easily understood and calculated, that it is wonderful they are not better known.

To take a couple of examples: the amount of depth of focus which a lens exhibits is absolutely fixed by the aperture of the lens, and by the focal length of the lens. It decreases as the aperture increases, and decreases as the focal length increases; any apparent departure from this rule being caused by differences in the maximum sharpness given, which may make it *appear* that with different lenses of the same aperture and focal length there are different depths of focus. This rule is absolute with our present knowledge of optics, and it appears likely that it may remain so, although it is dangerous to predict in such a case.

The rapidity of a lens depends on the ratio of the aperture to the focal length, increasing as the ratio increases. Assuming that the lenses are not stained, and making a very slight allowance for different degrees of concentration of the pencils of light between the front lens and the diaphragm, this law also holds absolutely true through a moderate angle.

We should not have thought it worth while to mention again these often repeated rules, but that in the discussion which followed Mr. Debenham's lecture, and in spite of the fact that Mr. Debenham had mentioned the rules in question

a member stated that he had an old portrait lens which exhibited extraordinarily more depth of focus than others of the same aperture and focal length, and that he had found that apertures and focal lengths bearing the same ratio to each other lenses of large diameter, were more rapid than those of small diameter.

DEATH OF THE REV. F. F. STATHAM.

On Tuesday morning, at about half-past seven, the venerable President of the South London Photographic Society breathed his last. As president of the South London Society, he has, by his universally kind and genial manner, won the affection of all, and numerous as have been the changes in the staff of the Society, we believe that during the twenty-five years of its existence, no proposal has ever been made to place any other person in the presidential chair. It was intended, as we have already announced, to hold a festival dinner of the Society at the Holborn Restaurant on Saturday, the 10th of May, in order to celebrate the twenty-fifth anniversary, and Mr. Statham, with his usual good nature, had promised to be present.

Mr. Statham was not informed that it was the intention of the members of the Society to present him with a memorial on this occasion, in the shape of a silver inkstand or some other article for the study table. As about thirty pounds has already been collected, it is proposed to collect such further subscriptions as may be offered, and to allow the memorial to take such a form as may be in accordance with the wishes of Mr. Statham's family.

Looking back into our volume for 1859, we find that at the first meeting of the South London Society, held on the 10th of May, Mr. A. H. Wall occupied the chair, but at the following meeting, held on the 9th of June, the following gentlemen were appointed as the officers of the Society:—*President*—Rev. F. F. Statham; *Vice-President*—Mr. W. Ackland; *Treasurer*—Mr. F. Howard; *Hon. Secretary*—Mr. A. H. Wall; *Committee*—Messrs. Cotton, Clarke, Herve, Hannaford, Leake, sen., and Leake, jun.

SOME *INTERIM* NOTES ON THE COLOUR SENSITIVENESS OF GELATINE EMULSION.

BY DR. J. M. EDER.

Some experiments I have recently made in a Steinheil's spectrograph with bromide and bromo-iodide gelatine plates have given me a few results which I think may be put on record, inasmuch as a good deal of attention has recently been given to the particular subject of which they treat. I will be very brief in what I have to say. Bromo-iodide of silver, in which the iodide and bromide of silver are emulsified and digested together, is more sensitive to green and yellow rays than pure bromide of silver. A mixture of one molecule of iodide of silver and eight to twenty molecules of bromide of silver is possessed of great colour sensitiveness.

Pigments act differently as optical sensitizers according as they are wet or dry when exposed with bromide or bromo-iodide of silver. For instance, fluorescein with soda, exposed wet, shows great sensitiveness for light-green and yellow-green, giving a dark absorption band; in a dry state, on the other hand, it has little effect.

Acid fuchsine and fluorescent blue raises the sensitiveness of the film for blue rays. Eosine alone has but little effect; but eosine with ammonia, whether used wet or dry, increases the sensitiveness for yellow and yellow-green. The plates produced by Attout and Clayton, of Paris, are prepared with brom-eosine; iod-eosine plates, which do not seem to have been experimented upon, will be found to exhibit this increased sensitiveness to a more marked degree still.

Braun, of Dornach, has recently brought out commercially a collodion, for the wet process, which is apparently treated with eosine, and which produces colours by photography, if not actually in their true light, at any rate with more truth than ordinary collodion gives. Hanfstaengel, of Munich, also, we believe, employs a similar method for reproducing paintings.

I have recently received from Dr. H. W. Vogel, of Berlin, a photograph of a picture coloured with yellow, blue, and gold pigments, which photograph most admirably reproduces the yellow lighter than the blue. So that altogether we seem to be making great progress towards perfection in photographing coloured objects.

At Home.

M. JEAN GEISER IN THE RUE BABAZOUN, ALGIERS.

There are certainly two studios of first class order in Algiers, if not more, for the capital of Algeria attracts the élite of Europe, and every winter a migration of fashionable and wealthy visitors sets in, swallow-like, towards this sunny seaport of the Mediterranean. From every section of Europe they come, but chiefly from France and England, some following doctors' advice to seek a milder climate, some simply following their own sweet will to escape a foggy November or drizzling February. Thus a favourite winter resort of well-to-do people, its handsome shops, and cafés, and theatres flourish exceedingly, and there is little doubt that for many years to come the town will increase in wealth and importance.

The two studios to which we specially refer are those of MM. Klary et Poter and of M. Jean Geiser. M. Klary, a name well-known to our readers, has for some time quitted Algiers; but still, for his sake, we resolved to pay his former studio a visit first of all. Unfortunately M. Poter was "très occupé" when we presented our card, although good enough to send a message that if we called again he would be happy to see us. So we promised we would call again; and when next we feel inclined for a trip of three thousand miles, and our fancy lead us Algiers-wards, we hope to become further acquainted with the studio.

In the meantime it was best, we thought, to bend our steps toward M. Geiser's establishment, and accordingly passed under the old-fashioned colonnades of the Rue Babazoun to where the studio is located. M. Jean Geiser follows the example of his Parisian brethren, and takes care to exhibit some pleasing pictures in various parts of the town. His show cases are exceedingly smart and fine, and the specimens of his work are of a quality that begets confidence in the photographer forthwith. But he makes this mistake; at the studio itself the examples of portraiture he exhibits are not only less attractive, but are exhibited in a less attractive manner. That is to say, when we entered and desired to have a portrait taken, instead of a series of choice examples being already set out for our edification, these had to be taken from certain japanned boxes. Not only are cartes and cabinets scarcely seen at their best in these circumstances, but since they get handled and shuffled over and over again, it is impossible to keep them fresh and attractive. No doubt they answer the purpose very well of patterns, but it would be far better to have them in cases or frames, where they are set out to advantage, and where there is no need to touch them. Soiled pictures discourage the customer a good deal, and although we freely admit that the specimens put into our hands were bright and fresh enough, it is impossible, in these circumstances, to keep them so. Still we prefer these japanned cases to dirty thumbed albums, which many studios have on the reception room table.

Algiers prices are Paris prices. For instance, in the studio of MM. Klary et Poter, the cost of a dozen cartes is 25 francs, and for a dozen cabinets 50 francs, panels being at the rate of 40 francs for the first copy, and 100 francs for

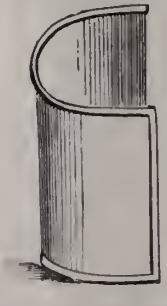
half-a-dozen. M. Jean Geiser charges also 25 francs a dozen for his best cartes, which are satinées, and for his cabinet pictures 30 or 50 francs according as they are plain or enamelled. But then we must admit that the work is quite equal to the best Paris work, and warmer praise it would be difficult to bestow.

We choose cabinet pictures, and are forthwith led up stairs into the studio. An assistant takes charge and demands a little more information. Would we like the portrait highly finished as in the specimen? We would. Would we like a picture with a large bold head? Certainly. Would we like to be taken in Arab costume? We would like, so we give our companion to understand, everything we can get; and, laughingly, the assistant invites entrance into a retiring room beside the studio to make our toilet.

This is a lovely little boudoir. There are soft Persian rugs on the floor, gilded furniture, luxurious settees, rich drapery of Turkey red, and handsome mirrors. Off come coat and waistcoat, and then our friend begins to robe us magnificently in strange and complicated vestments. We are wound round the body and head with drapery and sheeting, a bead necklace is put about the neck, and a sort of yarn twisted many times around the skull. It is rather hot, and uncomfortable, and stuffy all this, but one can well afford to suffer a little, to be surrounded by such pomp and circumstance. But just another word of approval on the subject of the retiring room before we quit it; the little room was not only one of the most brilliant and elegantly-appointed boudoirs we have ever seen, but its convenient position in respect to the studio enhanced its value to the visitor fourfold.

The studio is a blue studio. That is to say, its walls are blue, and it is glazed with blue glass. Of course there is plenty of light in a spot like Algiers, and therefore this little modification in the illumination is probably welcome. Moreover, a very small proportion of the studio only is glazed; it may be likened to a room with a very large window on one side, except that there is a sloping roof of ground glass just above the window, the latter rising from about six inches from the floor, and being eleven feet square. There are curtains to screen the blue glass, but this is bare opposite the sitter; still, the light is not permitted to pass straight to the model. Between him and the window is a delicate screen of blue tarlatan, which seems to soften the light without apparently weakening it. This screen is simply a folding frame (like a clothes horse), measuring 7 feet by 4 feet, with a double thickness of blue tarlatan stretched over it. Something of the same kind we have seen in Mr. Slingsby's studio in Lincoln, that gentleman employing, instead of blue tarlatan, a gauze of fine white muslin.

M. Geiser's favourite background is one of grey cloth of alcove formation. This is about six feet high, and measures



the same across. The cloth is simply nailed top and bottom to hoop-like frames of a solid character, so that it has no fastening, and is therefore perfectly smooth, where it acts as background. As we have said, the top light comes through ground glass, but a large white banner screen, measuring 30″ by 20″ is brought into requisition above the head of the sitter. For a cabinet portrait we sat five seconds, so that the illumination was not very strong; as our dress had a great deal of white about it, no doubt M. Geiser preferred not to have a very short exposure. The camera and camera-stand were exceedingly stable, the latter being of iron.

M. Geiser himself does not make his appearance until the last moment. The assistant goes on with the work by himself until the moment actually arrives for exposure, when the principal is called. The latter, however, is not by any means disposed to take things as he finds them. Although he very quietly expresses approval, admiringly saying, "La pose est très bien; mais c'est très bien," he nevertheless proceeds to change most of the details. He both re-arranges the posture and alters the lighting, taking great pains as to the pose of the head and the fall of the drapery. In a word, he not only impresses the sitter with the fact that he is doing his best, but that he is doing it with heart and soul.

We are rather a troublesome model, neither patient nor steady, and albeit his words express satisfaction, we feel we are giving a world of trouble. The head will droop, no matter how firm we mean to be, and when at last M. Geiser appears to be satisfied, the wretched turban seems to be gradually but surely falling off behind. However, all's well that ends well, and the result, it must be admitted, is an excellent one. In fact, we do not know that we have ever sat for a better picture.

"Will you be good enough to leave your name at the bureau?" is the request, as we are bowed out of the studio. We descend and make our way to the office, where we find a gentleman ready to book the order. "On est prié de regler la moitié de la somme d'avance," says a neat little placard over the desk, intimating that half the amount of the order is to be deposited; but as, in our case, there might be some difficulty in forwarding the other half, we tender the whole payment at once. It is some time before the man of business can understand this, but when he does he is very anxious our name may be properly booked—so anxious, indeed, that he thinks it is not spelt correctly on the card we tender him, and therefore proceeds to alter a D into a T to make it conform better to his ideas of it.

The time occupied in booking, making out the account, and paying, suffices amply to permit the negative being developed, and allows the photographer to make sure the photograph is a good one before the visitor departs. It is a much better arrangement than keeping him waiting in the studio, for it economises his time—which is often of value, notwithstanding many photographers' view of it—and also does away with the purposeless waiting to which sitters are unfortunately subject. Finally, the plan impresses the sitter with the idea that the studio is well governed, and that the photographer knows his business. This is the lesson to be learnt from an African studio.

THE SPECTROSCOPE AND ITS RELATION TO PHOTOGRAPHY.

BY C. RAY WOODS.

VI.—The Reducing Action of the Spectrum on the Haloid Salts of Silver, etc., applied to the Making and Working of Sensitive Films.—*Continued.*

In considering the relative values of the different haloid salts of silver for ordinary photographic purposes, the question arises—"What rays can we most conveniently work with?" There can be no question as to what rays would be most suitable, if we could get a good ground for them to act upon, for since the yellow rays have the greatest effect upon the eye, the photographer would obtain results more nearly approaching to what we see in nature by using a medium more sensitive to that part of the spectrum than to any other. But, as he knows full well, these rays have an almost inappreciable effect upon

the substances he finds most readily workable. Taking the three compounds, chloride, bromide, and iodide of silver, and arguing from theory alone, the choice lies between the two first. Could iodide of silver be obtained in an emulsion in a readily developable condition, it possesses a great drawback in its comparatively small range of sensibility to the spectrum. The fact that its sensitiveness ends abruptly in the dark blue near G would place it out of the competition unless it could be rendered very sensitive indeed, and though it extends lower in the spectrum when sensitized by nitrate of silver, it will be readily seen what an advantage was gained in the wet process by the addition of bromide to the collodion. Chloride of silver is sensitive almost as low down as bromide, but its maximum of sensitiveness is in the ultra violet. Now since the ultra violet rays are largely absorbed both by the atmosphere and by glass, there can be no doubt, theoretically, that the practical man is doing right by making bromide of silver the corner stone of his industry. In bromide of silver he has a substance possessing a great range of sensitiveness, and he is using rays the quantity of which can be to some extent estimated by the eye. Chloride and iodide of silver can both be added to emulsions with advantage, but they must occupy only a secondary place. Chloride of silver, which is not so often present in a film as it might usefully be, will be found to confer a great increase in sensitiveness in summer weather, and for work in tropical climates is an invaluable addition to plates used for so-called instantaneous exposures.

The writer has found that emulsions containing about ten per cent. of chloride and three to five per cent. of iodide, whilst possessing at home all the good qualities of a slow working plate, latitude in exposure, density, &c., have been found to be more rapid in the tropics than many plates which he has regarded as highly sensitive at home. It is a moot question whether chloride of silver should be added to a bromide of silver emulsion after boiling, or should be emulsified at the same time and boiled with it. Adding the chloride emulsion after boiling would appear to be the best method of procedure, for this reason—that chloride of silver cannot be boiled as long as the bromide without running the danger of fogging it. It would seem advisable, therefore, to make an ordinary bromide or bromide and iodide emulsion first, raise it to the highest possible degree of sensitiveness, and then add the desired quantity of a chloride emulsion that has received as much boiling as it will stand, and will give a clean transparency with ferrous-citro-oxalate developer. There is still the question whether chloride and bromide of silver when emulsified together form a double molecule? But if so, this cannot greatly affect the result, for the double molecule is, in the other case, formed during exposure. One disadvantage in the addition of chloride may be mentioned here, though it does not come directly within the scope of these articles—viz., that with the alkaline developer one runs a greater risk of green fog, and the ferrous-oxalate has to be used for safety's sake.

The use of iodide in an emulsion in anything like the small proportion usually adopted is rather a question for the emulsion maker than the spectroscopist. When present in a small proportion, it has many beneficial effects—notably, cleanness in working, latitude in exposure, and prevention of halation. Emulsions should not contain more iodide than is found sufficient to produce these effects; five per cent. will generally be found sufficient, and at most it is hardly advisable to go beyond eight per cent. Even with this small proportion, there is, according to Captain Abney, a slight loss of sensitiveness near G, although the emulsion itself may be quite as sensitive in the camera as one of pure bromide. Where a large proportion of iodide is used, the image obtained is usually thin. Another advantage in favour of a small percentage of iodide is, that it lowers the sensitiveness of the emulsion towards the red, and enables one to work with a brighter light in the developing room; and as the sensitiveness of a gelatino-bromide plate to the less refrangible rays is very small as compared with its sensitiveness to the blue rays, an advantage is met with in actual practice by doing away with the sensitiveness to the yellow and red altogether, if possible. The general opinion is, that iodide is best emulsified after the bromide and before boiling, in order to get as fine a state of division as possible; and though an emulsion containing iodide takes longer in the boiling process than one of pure bromide, quite as high a sensitiveness may be obtained, with less danger of over-boiling.

In considering the behaviour of different substances when exposed to the spectrum, there is one point which must not be overlooked; this is, the relation existing between the colour of the substance and the rays which act upon it, or, in other words, the relation between absorption and work. The best illustration of this that can be given is the case of some transparent medium such as an alkaline bichromate. In the accompanying diagram, taken from a transparency kindly lent me by Captain Abney, and shown by him at several of his lectures, it will be seen that the rays which the bichromate absorbs are those rays which reduce it in the carbon printing process.

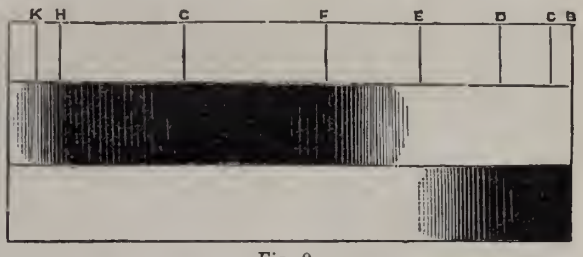


Fig. 9.

1. Fraunhoferic lines. 2. Spectrum on bichromate (carbon tissue) 3. Rays bichromate allows to pass through.

With the haloid salts of silver, this relation of absorption to work is not quite so noticeable, as, instead of a transparent substance, we have a number of semi-opaque particles, and a certain amount of white light passes through in addition to that rejected by the particles. Nevertheless, the absorption of light in the parts of the spectrum which act on the sensitive film is sufficiently marked to render prominent the distinctions between chloride, bromide, and iodide of silver.

It has been shown (fig. 8, Nos. 1 and 2) that in the case of chloride we can have it in two states, yellow and bluish-grey, the former being unboiled, and the latter the boiled. Iodide can also be obtained in two corresponding states, but the effect of heat can best be studied with bromide of silver, for the simple reason that we know more about it. The increase in sensitiveness is usually regarded as a consequence of the increase in the size of the particles brought about by boiling; the boiling may be carried, so far, however, as to produce a very coarse—almost insensitive—form. There are several different states in which bromide of silver can be obtained, but the differences are in some cases not so marked spectroscopically as they are to the eye.

We have, in the first place, the orange form of bromide; on boiling, or by the ammonia process, this is converted into a bluish grey, perfectly distinct to the eye. When acted upon by the spectrum, and developed, however, it is found that there is very little difference in them after all, the boiling having been mainly instrumental in rendering the compound more sensitive; the maximum remains the same, but the blue-grey form extends further towards the red. It does not appear likely, therefore, that we shall be able successfully to borrow an idea from the Bessimer steel process, and see, by the spectroscope, when our emulsion is sufficiently cooked; for if the light passing through a boiled and an unboiled emulsion be examined

by the spectroscope, it will be found that the cooked bromide derives its bluish tint from a small amount of orange-red and red light which it absorbs over and above its absorption when unboiled. The eye-test without the spectroscope will be found the best guide.

It is still a moot question whether silver bromide in gelatine differs from the same salt suspended in collodion. Spectroscopically, the difference is not very noticeable, but with the previously-mentioned example showing what a contrast to the eye a slight difference in absorption may produce, this cannot be allowed much weight. On various grounds, given at length in the PHOTOGRAPHIC NEWS, Dr. Vogel draws a marked distinction between the two, calling the silver bromide in gelatine the blue-sensitive form as distinct from indigo-sensitive, the term he applies to silver bromide in collodion. According to Dr. Vogel, the sensitiveness of modern dry plates is due to the blue-sensitive form becoming considerably more sensitive on boiling than the indigo-sensitive form. It must be noted here, that Dr. Vogel is careful to use the terms *blue-sensitive* and *indigo-sensitive*, not *blue* and *indigo*, the term *blue-sensitive* applying as much to the boiled as the unboiled bromide of silver in gelatine; the term indigo-sensitive has a similar application, referring to the point in the spectrum at about which the maximum comes.

Bromide of silver can be obtained in a form markedly different from any of the preceding by boiling a collodion emulsion with a large excess of nitric acid. In this state it is distinctly green, but may be brought back to the orange state by rubbing. This form of silver bromide, which Captain Abney uses for photographing the ultra-red rays, has two maxima (Fig. 8, No. 5), the ordinary maximum near G, and another an octave below it. With this form, the ordinary photographer is hardly likely to have anything to do, but it will be as well to note that it differs entirely from gelatino-bromide emulsions which have been prepared for photographing the red end. With these latter we do not get the formation of a second maximum, but merely a continuation of sensitiveness towards the less refrangible portion of the spectrum, a fact which must be borne in mind when considering what light it is advisable to use to illuminate the dark-room.

ON LENSES.

BY W. E. DEBENHAM.*

IN treating upon the subject of photographic lenses, certain optical terms have to bo introduced, which will, therefore, be explained without going more deeply into the scienee of optics generally, than is necessary for the intelligent consideration of the subject in hand.

Planes of Definition.—It is to be regretted that in such a science as optics, where the calculations are made upon very exact bases, such an incorrect term as "plane of definition" should have come into uso. The surface upon which true definition is projected is almost always a curve. It must, therefore, be borne in mind that, if the expression, "plane of definition" be employed in what follows, it is only to bc understood in the conventional sense.

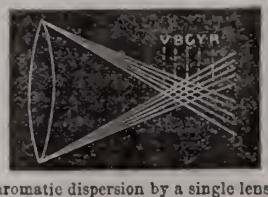
Focus, Equivalent Focus, and Conjugate Foci.—The focus of a lens is the place at which the rays proceeding from it meet to form an image. The word "focus" is also employed to mean focal length for parallel rays, and in the ease of a single plano-convex or double-convex lens, is ascertained by measuring the distance of the image which it gives of the sun, or any very distant object, from some point in the lens itself. With a double combination the expression "oquivalent focus" is used to denote the focus which would be possessed by a single lens, giving an image of the same size, as that produced by the combination. There are various means of ascertaining the equivalent focus of a combination. A very common one is to focus some object of the same size as itself, and then to take one-fourth of the distance from the ground glass to the object, as the focus required. This method is not quite accurate, for it takes no account of the effect produced by the separation of the lenses, and is not always practicable, as there may not be a camera extending sufficiently to give an image of the same size as the original. A method which I published in 1879, in connection with a proposal to introduce a standard of rapidity for lenses; which standard has since been adopted, is, I think, to be preferred. Focus an image of some definite proportion; then measure the distance from the ground glass to the original, multiply by the number representing the proportion, and divide by the square of a number larger by one, than the number which has been used as a multiplier. Thus, if marks twelve inches apart are made, or a foot-rule be planted with a head-rest against the background, and these marks or the length of the rule be focussed to be three inches apart upon the focussing-sereen, measure the distance from the background to the sereen, multiply by four (the number of times that the image is smaller than the object), and divide by twenty-five. This will give the equivalent focus with only one-quarter of the error that exists when focussing the object of full size, and is quite near enough for the purpose required. Conjugate foci are the distances respectively of the object and the image from what is known as the optical centre of the lens.

Aperture, Angular Aperture, and Rapidity.—The aperture of a lens is its working opening as limited by the diaphragm. The angular aperture, often spoken of simply as "aperture," is the proportion between this opening and the equivalent focus of the instrument. It has been customary to denote this aperture by means of a fraction *f*, the focus of the lens being the numerator, and the relation of the focus to the aperture being the denominator. Thus, $\frac{f}{4}$ describes the opening of an ordinary portrait lens, which, having a focus of twelve inches, has an opening of three inches. The rapidity of lenses is in inverse proportion to the square of the number used as denominator; but as the calculation of this is rather involved, it has been decided to accept $\frac{f}{4}$ as the standard or unity, and to reekon diaphragms by the length of exposure required in comparison with this unity. Thus, with a diaphragm of $\frac{f}{4}$, requiring au exposuro of four times that required with $\frac{f}{4}$, the diaphragm is, on the universal system, numbered four.

It might seem unnecessary to add (but that I know it is not universally understood) that when from any reason a small stop must be used, the most rapid lens is no more rapid—disregarding any variation due to colour or difference of reflecting surfaces—than the slowest one of the same length of focus which is capable of having the same-sized stop; so that if, in order to get what has been called "depth of focus," a small stop has to be used, there is no object on the score of rapidity in using a rapid, lens, and, perhaps, a slow lens may, from its other properties answer the purpose better.

Achromatic, Actinic.—The various rays which, compounded, make up white light, are refracted or bent aside in different degrees. They are, therefore, dispersed as well as refracted; and those rays which possess the greatest chemical power, or produce the most effect photographically (particularly the violet), are more refracted than those, such as the yellow, which give the greatest visual power. The effect of this is that, with any simple lens, a series of images of different colours is formed at different distances from the lens itself. The image will be most distinct to the eye when the yellow rays aro in foeus, but will give the sharpest photograph at or near the place where the violet rays come to their focus. In a lens which is not corrected, therefore, the camera back has to be shifted a little in, after focussing. The extent to which this will be required varies with the kind of glass used, but may be taken as from one-fortieth to one-thirtieth of the focal length. In tho diagram, as in other diagrams, the amount is exaggerated, in order to make it easily seen.

Fig. 1.



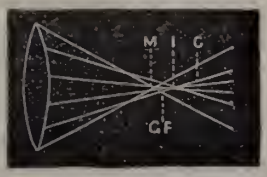
Chromatic dispersion by a single lens.

* A communication to the London and Provincial Photographic Association.

In uncorrected telescopes the evil is seen in coloured fringes surrounding light objects. Newton thought that the defect was irremediable; but it was afterwards found that different refracting substances dispersed the light in different proportions from those in which they were refracted, and, therefore, by uniting a convex lens of a substance of low dispersive power, with a concave one of a substance of high dispersive power, it was possible to let the dispersive forces balance each other, and leave a surplus of refractive power in the convex lens to form an image. Acting upon this discovery, Dollond, more than a century ago, constructed the achromatic (without colour) telescope. There is a slight difference between the amount of correction given to lenses for visual purposes and those for photographic use. The word "actinic" applied to lenses means that they are corrected for photography.

Spherical Aberration.—Spherical aberration is so important that it is well to understand clearly what it means. It is that characteristic by which the different parts of a lens uncorrected for this defect, bring the same object to different foci. It is evident that this must result in confusion or want of sharpness.

Fig. 2.



Spherical aberration. C. Focus of central rays. M. Focus of marginal rays. I. Focus of intermediate rays. G F. General approximate focus of the whole lens.

When an image is projected by an ordinary uncorrected lens, the marginal portions of the lens bring the rays which pass through to a focus nearer the lens than the focus of those rays which pass through the centre of the lens, and the rays passing through the portion of the lens between its centre and its margin are focussed at an intermediate place. This is called "spherical aberration," and where it exists perceptibly, no truly sharp well-defined image can be obtained, as every point is represented by a circle. The nearest approach to a distinct image is where the circle of confusion is small, and the concentration of rays great, as marked in the diagram. If a stop or diaphragm be now used, cutting off the marginal rays, the focus will be lengthened to the point where the central rays meet.

Aplanatic means without spherical aberration.

Astigmation or Astigmatism.—If a cross be distinctly marked upon a card and focussed in the centre of the field of a lens, the two arms will be seen with equal distinctness. If now with an ordinary portrait lens the camera be swung round or tilted, so that the cross appears near the margin of the field, it will not be found possible to focus both arms of the cross at the same time. If that arm which is in a line with the diameter of the field be focussed, the other will be wanting in sharpness. By turning the lens outwards, this other arm may be brought to a focus; but then the first one will be no longer distinct. The image of a point of light falling near the margin of the field of a lens possessing considerable astigmation, cannot be focussed sharply. On moving the lens it will be seen that the point takes the form of an oval, or an approach to a short line, either in the direction of the diameter, or the circumference of the field, accordingly as the lens is racked in or out. If a line happen to be in the same direction that the point is elongated it appears sharp, but if the elongation be across the line the latter will be blurred. This characteristic is called "astigmatism" or "astigmation."

Distortion is caused by different portions of the lens engaged in forming the various parts of an image, acting as prisms in bending aside the ray of light. Thus, with a single lens and a diaphragm at a distance from it, the axis of the ray coincident with the axis of the lens is not bent aside at all, but those rays coming from parts of the object towards the margin of the field, impinge upon portions of the lens possessing the form of a wedge or prism, and the nearer the margin the more this is the case. The images of those portions of the field are, therefore, turned aside, and, whether the stop be in front of the lens or behind it, proportionally more so the farther they are from the axis. Distortion is avoided by having an additional lens upon the other side of the diaphragm, giving a like amount of distortion, but in the contrary direction.

Curvature and Flatness of Field.—With an ordinary lens the focus of different parts of an image of equally-distant objects, will be at something like the same distance from the lens, and to get them all sharp at the same time, therefore, it would be

Fig. 3.

Curvature and flatness of field.

necessary to employ as the focussing-screen or the sensitive film a portion of a sphere instead of a flat plate. When the oblique rays have their focus lengthened out, as shown in the dotted lines, so as to fall upon a flat surface, the lens is said to have a flat field. Lenses corrected in any degree for this evil are said to be more or less flat-fielded. The great difficulty has been to get flatness of field without introducing an intolerable amount of astigmatism.

Absolute flatness of field must not be expected. The sacrifice of other good qualities in order to obtain this characteristic, over any but a small portion of the centre of the plate, is so great that, except with lenses where a very small diaphragm is used, it is only attempted approximately. It is, however, so valuable a quality that those lenses in which it has been made a particular point of, are for most purposes to be preferred. It is, perhaps, the one quality to obtain which, opticians would be justified in making greater sacrifices in other directions, than they have generally been disposed to do. A lens may be examined for it in the following manner:—Focus some object sharply in the centre of the field; then swing the camera round, so that the same object comes to points on the ground glass, at regularly-increasing distances of (say) one inch from the centre, and mark how much the lens has to be racked in, at each distance. Now draw a straight line, and at distances upon it equal to those upon the ground glass, make uprights corresponding in length, with the amount which the lens has had to be racked in at each distance, to get the best focus. Join the tops of these uprights by a line, which line will describe the curvature of field of the particular lens. This line should be compared both with the straight line from which it diverges, and with the circumference of a circle having a radius equal to the focus of the lens for the object that has been focussed. In order to reduce to an insignificant minimum any error arising from not having swung the camera accurately upon the optical centre of the lens, some distant object should be selected for focussing.

Flatness of field only implies the delineation upon a flat surface, of objects at equal distances, and, therefore, even if absolutely attained, would still require for even definition, that the various objects included should be placed in a semicircular curve round the lens, unless these objects were all so distant, that the rays proceeding from them are indistinguishable from parallel ones. To delineate upon a flat field the image of a flat surface, such as a map or a newspaper, would require the marginal rays to be so much lengthened, that the field for parallel or distant rays would be actually curved the other way—that is, convex instead of concave.

By those unacquainted with the science of optics, curvature and flatness of field have often been confounded with spherical aberration and aplanatism; and, indeed, a diagram showing only the former characteristics, has actually been given by a professed teacher of the subject, in illustration of the word aplanatic.

Diffraction has been spoken of in connection with photographic optics. If it were really necessary to take it into consideration in the calculations for the construction of a photographic lens, these calculations would be even more complicated than they are at present. Fortunately, this is not the case, and, as no scientific optician has admitted it as an element into such calculations, it may be dismissed.

(To be continued.)

Notes.

The funeral of the late Mr. Statham, Rector of Walworth and president of the South London Photographic Society, takes place on Saturday next, at 4.15 p.m., at Norwood Cemetery. Service at St. Peter's Church at 3 p.m.

The Royalist party in France have apparently much faith in the efficacy of photography to stimulate feelings of loyalty. In the Department of the Gard a wholesale distribution of photographs of the present head of the Royal Family is going on, greatly to the disquietude of the authorities of the Department, who have given information to the Government.

We have not yet elevated the photographer to the rank of the newspaper interviewer. In America this seems almost to be the case. Mr. Moncure Conway, writing in the *Pall Mall Gazette* on the Cincinnati riots, tells how a youth charged with murder was goaded into a confession by policemen, reporters, and *photographers!* It does not appear that the accused was really guilty, and his confession was exceedingly unlucky, as it was over this identical criminal that the Cincinnati populace went mad.

It is a pity the sizes of the standard flanges recently fixed by the Photographic Society are not expressed in millimetres. It is of importance to British photographers that its standards should become international, and there is little chance of this, however much foreign countries may desire to adopt them, if we express measurements in inches and fractions of inches. The Belgians and Germans for the most part prefer our dry-plate measurements to the French because they are more convenient, but they get sadly bothered in consequence.

Now several opticians on the Continent are taking up the Photographic Society's standard screws and flanges. Herr Suter, of Basle, whose instruments are favorably known in this country, is one of these firms, but it is not an easy task converting sixteenths of an inch into metrical measurements. Whereas, if our Society had elected to call its flanges by millimetres, we should have had such simple figures to deal with as, say, 15, 25, 36, 72; and these, while quite as intelligible to our opticians, would be perfectly understood throughout Europe and America.

The conditions of photographic copyright in America seem to have been in a very hazy condition, and a recent decision in the Supreme Court at Washington does not put the question on a much firmer footing. A lithographic company copied a portrait of Mr. Oscar Wilde taken by Napoleon Sarony, who thereupon sued the company for an infringement of copyright. The Circuit Court decided in favour of Mr. Sarony, and the case was then brought before the Supreme Court, the question raised being whether Congress had the constitutional right to protect photographs and negatives by copyright. From this we may assume that there is no especial Act for the protection of photographs, and that consequently the question turned upon the point as to whether photographs are works of art or not. The decision of the Supreme Court, which affirmed the decision of the Circuit Court, is instructive. It held, "first, that the Constitution was broad enough to cover an Act authorising copyright of photographs, so far as they are representations of original intellectual conceptions of their authors; second, that the finding of the facts shows that the photograph sued on was an original work of art, which was the product of the plaintiff's intellectual invention, and of which the plaintiff was the author."

So far, this is satisfactory, if it may be admitted that the posing of a sitter or the selection of a landscape is always an operation involving "intellectual invention." But the Supreme Court evidently has doubts on the subject, for it declines to "express an opinion as to whether this protection would extend to a mere mechanical reproduction by the photographic process of the physical features of an animate or inanimate object involving no intellectual effort in its execution." This decision was of course sufficient for Mr. Sarony's purpose, but it really establishes very little, as in all future copyright disputes it will always be open for the copyist to argue that the photograph he copied "involved no intellectual effort in its execution."

Our contemporary the *Standard* seems never to have heard of photography in connection with bicycling; yet before the days of the modern tricycles, many two-wheeled machines carried an amateur photographer in the saddle. A party of American bicycle riders, numbering between thirty and forty, are to visit the United Kingdom this summer, it appears, and afterwards they cross the Channel for a run as far as Venice. The *Standard* allows that the scheme is not an extravagant one, "but even if the machines were of the best, there are portions of the programme that are impracticable. For instance, some members of the party are to carry bijou cameras, and such "bits" as please the eye of the American artist in the company are to be photographed." If the 'cyclists will confine themselves to a "bijon" camera, there is nothing infeasible about the matter that we can see; the pictures would be but winks and snatches, it is true, but they would be pleasing reminiscences to their owner.

The Austrian photographers are exercised in mind on the subject of trade guilds. Every calling has its "union,' very much as in this country, and the effort is being made to attach the photographer to some of the existing guilds. Unfortunately, the modern photographer makes use of many applications in his art, and the guilds set their face against pluralists. Thus a lithographer dare not, without permission, work from zinc as well as from stone, as this might injure other guilds. Photographers are not sufficiently numerous to constitute a guild by themselves, or the obstacle might be overcome; meanwhile the difficulty gives rise to some curious incidents. Because the photographer employs paste for mounting, he is sometimes classed with the bookbinders, and in one instance,

even, was bracketed with brush-makers, because, forsooth, he made use of a brush.

We have lately received no less than three handbooks of photography issued by different firms of photographic dealers. We should very much like to say a few words in favour of them, but hesitate to do so, since we fear to praise one at the expense of another. When, however, we mention, that these columns have been heavily laid under contribution, the volumes must necessarily contain much that is good, their value, moreover, being in no way marred by any tedious repetition to the source whence they derive their information.

According to the *Journal de Liège*, the forgery of bank notes goes on as merrily as ever, one clever set of operators being in a position to split into two, new notes that have never been folded. Blue ink, which was adopted by reason of the difficulty involved in reproducing it by photography, is not now relied on so much by bankers abroad; some of them have recently taken another means of defeating the photographic forger. This is no other than the employment of an invisible actinic ink, of which no trace can be seen on the bank paper nor upon the image on the focussing screen. As soon, however, as you come to develop your plate bearing a reproduction of the bank-note, the word "forgery" appears in bold letters right across the negative.

Mr. R. A. Proctor's theory, put forward in this month's *Longman's Magazine*, that most of the recently-discovered planets may be referred to sun-spots, will not be acceptable to the discoverers. Photographers, however, will be interested in knowing that Mr. Proctor's statement is substantiated by photography—if, indeed, photography did not suggest it to him. He observes that the chief interest of the lesser markings on the sun's surface is, that to the unpractised observer they look very much like small planets in transit, and expresses his conviction that every recorded case of intra-mercurial planets seen in transit is to be thus explained, from the case of Lescarbault's Vulcan, down to the case of Vulcan's supposed return as seen in China. This "return," however, was unfortunate for the discoverer of the so-called planet, as a photograph of the sun happened to be taken at the right moment, and proved unmistakably that what had been described as unquestionably a planet, moving like a planet, and unlike a sun-spot, was nevertheless a small sun-spot after all!

The general public have advanced somewhat in their knowledge of photography since the days when Mr. Boucicault wrote *The Octoroon*. The drama has lately been played at the Grand Theatre, and there was nightly presented to the audience the spectacle of a murderer being traced through a sensitized plate being left in a camera where the murder was committed. Despite the fact that the lens is uncovered for some time both before and after the murder, the impression of the scene remains on the plate, the sensitive film cleverly contriving to be sensitive only at the precise moment when its assistance is required. This is a "detective" camera with a vengeance! But really this portion of the play should be re-written to bring it to the scientific requirements of the age. As it is, the incident is simply ridiculous.

Novelists are continually making use of photographs as a means for developing their plots. The latest idea is to utilise them to delineate character. Thus the author of "Eugenia," one of the orthodox three volume productions just published, to show the utterly vulgar and brutal disposition of a certain personage, makes him tear out of his album the photographs of his parents and family because he thought they were ungenteel, or, as he expresses it, because they were "a fiddle-headed lot." But may not the gentleman have been unjust to his family? Supposing, for instance, the "fiddle-headed" attribute, whatever that may be, had been due to bad photography?

Few photographers realise how much the electric light is now-a-days utilised in photography. They know that certain studios in various European capitals employ electricity, and that it has from time to time been used to produce enlargements and Woodbury relief plates. But they will be surprised to know that every photo-etching establishment in London, and in the big cities of the United States—and these may now be counted by the score—have the electric light installed. These establishments have little chance of existence unless they can produce a printing block in twenty-four hours—that is, take a negative, print it, and etch a metal impression—and some energetic firms there are, who will do the work from first to last in three or four hours. Obviously, this would be impossible without the electric light.

We have not heard much lately about spiritualistic photographs. Perhaps those who investigated the subject will be interested in hearing that mesmeric power can be transmitted through the medium (no joke intended) of a photograph. Mr. J. N. Langley, who lately lectured at the Royal Institution on Mesmerism, told a story of a woman who had been accused of stealing photographs. The woman was an employée in an hospital, and had been charged with the theft by one of the doctors. There was, however, little proof forthcoming, until one day, while taking a photograph out of a drawer, she heard the hospital gong sound, and became mesmerised, according to Mr. Langley's theory, by "sudden fears." She remained like a statue with one hand plunged in the drawer, and thus she was found by the doctor who had been the accuser. This is a very pretty story, but we do not care much about Mr. Langley's explanation. Why should not the mesmeric state have been caused by "unconscious cerebration" on the part of one or more originals of the photographs? Then we are not told what the photographs were. If they consisted of a collection of the inartistic monstrosities of a quarter of a century ago, with their bye-gone fashions, it is easily understood how the woman became paralysed with a sudden horror.

Patent Intelligence.

Applications for Provisional Protection.

6443. Thomas Percy Graham, 5, St. Mary's Buildings, Bedford, Bedfordshire, Photographer and Artist, for "An improved folding ship photographic accessory."—Dated 17th April, 1884.

6491. Lucy Mallock, wife of Major T. J. R. Mallock, the Royal Fusiliers (City of London) Regt., care of Messrs. Williams and Co., Dorsetshire Bank, Axminster, Devonshire, at present of 1, Queen's Place, Southsea, Hampshire, for "An improvement in menu or programme or photograph holders, which she calls the floral menu or programme or photograph holder."—Dated 18th April, 1884.

Patents Granted in America.

296,391. Ezra Cope, Hamilton, Ohio. "Art of printing by sunlight or other light, and apparatus therefor."—Filed Jan. 5, 1884. (No model.)

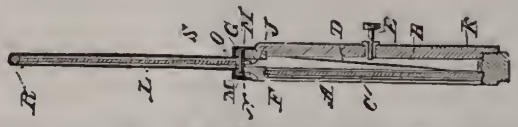
Claim—1. In a sun-printing apparatus, an envelope provided with an exhaust-aperture, and having one of its layers of proper transparency, and one or both of its layers of collapsible limpness, substantially as and for the purpose specified.

2. In a sun-printing apparatus, an envelope provided with an exhaust-aperture, and having one of its layers of proper transparency, and one or both of its layers of collapsible limpness, and adapted to receive a sensitive sheet or a negative, or both, substantially as and for the purpose specified.

3. The improvement in the method of securing close contact between the negative and sensitive sheet in the art of sun-printing, which consists in connecting them together and exhausting the air from between them, substantially as set forth.

296,443. Sebastian S. Peckinpugh and George Jeffery White, Big Rapids, Mich., assignors to said White. "Photographic plate-holder and case."—Filed September 25, 1883. (No model.)

Claim.—The combination, with a plate-holder, of the plate or strip D and the adjusting-screw E, substantially as herein shown and described.



296,578. Robert H. Jones, Marcus B. Smith, and Lars J. A. Roswall, Clarence, Mo. "Apparatus for cleaning photographs."—Filed Jan. 9, 1884. (No model).

A washing tray worked by clockwork.

Review.

Picture-making by Photography. By H. P. Robinson (*London: Piper and Carter*), 2s. 6d.

Mr. Robinson's capital volume, which appears so opportunely with the spring weather, is likely to send many of us into the country "picture-making." There are few things more pleasant than working in the open air in fine weather, and until it is fine, the reader will find it almost as pleasant reading Mr. Robinson's book, and looking at the many pictures it contains. By-the-way! why do not all authors write pleasant books. Or rather, why do readers read books that are not pleasant; it is a sin of which we ourselves are never guilty, except perhaps when we read something of our own. Some people have an idea that when you want to teach, you must be prosy; yet look at Ruskin, and at Darwin, and at Huxley, and other great masters. Mr. Robinson, we are glad to say, has taken a leaf out of their books—he has taken several from Ruskin—and the result is, he has produced a very readable work, which every art student will read with interest.

Mr. Robinson's earlier book, "Pictorial Effect," has run through three English editions, two American editions, and is translated into French and German. We make bold to prognosticate a still greater success to "Picture-making by Photography," of which every line is agreeable reading, and every page full of valuable teachings, the result of life-long study by an artist who has won for himself a name in painting and etching no less than in photography. Mr. Robinson's teachings will be none the less valuable because they are personal, as he tells us in his little editorial speech. Here it is:—

It has been said of Gibbon, the historian, that he did not always sufficiently distinguish between his own personality and that of the Roman Empire. I am afraid that the following chapters may be open to a similar objection. I fear that a great deal more will be found concerning my own personality and productions than a modest writer would willingly admit; but this cannot easily be avoided. The nature of the information to be conveyed, and the lessons to be inculcated, demand that I should teach the results of my own experience, and suggest that the pictures which have been the outcome of that experience would be the most suitable illustrations. It will be evident that pictures which have been actually produced by photography will better show the peculiarities and limitations of the art than any other method of illustration.

That photography should be not only the recorder of bald prosaic facts, but also the means by which something akin to imagination or fancy—real live art—may be worthily embodied, has been the one aspiration of my life. To this end, my aim has been, in the following chapters, to induce photographers to think for themselves as artists, and to learn to express their artistic thoughts in the grammar of art. It is not the fault of the art of photography itself that more original pictures, exhibiting many of the qualities shown in other arts, are not produced. The materials used by photographers differ only in degree from those employed by the painter and sculptor.

We only wish we had space for more extracts from Mr. Robinson's volume, but we select one which will give some idea of the value of "figures" in landscapes. Figures, if judiciously introduced, not only impart life into a picture, but, as Mr. Robinson shows, will very often balance a composition most effectively. What too often comes under the name of "photographic landscape," is a very dull bit of country indeed, forsaken of man and beast; and Mr. Robinson will have done much, if he can teach some of his brethren how to lighten up these deserted spots with a figure, artistically handled and posed. Of course this introduction of life is a risky matter, for a figure as often mars as makes a picture, and for this reason the matter is generally shirked. Here is what Mr. Robinson says:—

I now propose to give one or two slight examples of how a subject which would be otherwise uninteresting may be rendered pictorial by the introduction of a figure or figures. It is difficult

in small wood-cuts or block illustrations to give an idea of photographs, and, in the present illustration, I must trust a good deal to the imagination of my readers aided by description. The subject of the first illustration consists of a pool of water, with an overgrown hedge-row partially over-hanging it, and a bit of distance. In itself there was nothing in this of which a picture could be made; but the arrangement of the lines, and the breadth

of light and shade, suggested possibilities which should not be neglected. All that was wanted was a point of interest which would first attract and gratify the eye, give a meaning to the subject, and collect together and harmonize the scattered light and shade. It was obvious that a figure or two would easily do all that was necessary if they were well placed, and could be made to look as if they were in their natural and right places. It was not necessary that they should be large (indeed, in this case, I have chosen an example showing how valuable small figures may be), but they must be, above all things, conspicuous. Two figures were therefore chosen, and dressed in the extremes of black and white. They were placed at the balancing point of the angle of the composition, to give it support, and in opposition to the greatest distance, so as to throw it back and give space. The figures are occupied in "Watching the Newts," which provided a title."

I will now give an example of how an uninviting bit of coast may be turned to pictorial account by the addition of appropriate figures. This time I have purposely chosen a subject in which the figures are larger, and form a more important part of the composition than in the first illustration. In this case, I give the bit of coast without the figures, in contrast with the completed

picture in which the figures are introduced. The subject is that of a girl looking into the basket of a friend who has been shrimping, and asking the question: "What luck?"

The work is illustrated by between thirty and forty illustrations, including four whole-page pictures by the photo-ink process.

ON THE PREPARATION OF GELATINE PLATES.

BY H. A. HOOD DANIEL.*

In taking up this subject upon which to read a paper before the Association, I do so with a considerable amount of diffidence, as it has been so fully and ably treated in the journals by those who have been able to devote, not only their spare time, but the whole of their time to it, both theoretical and practical students.

* Read before the Bristol Photographic Association.

However, as I have, ever since I adopted the gelatine process, made almost all the plates I have used, I am perhaps somewhat qualified to offer some few remarks upon this subject, and which remarks I shall endeavour to make of as practical a nature as possible. In this determination I am perhaps somewhat strengthened by the belief that much assistance can be given by verbal explanation and occular demonstration, which written treatises will not adequately convey; and by certain enquiries made by various members which have seemed to imply a desire that I should give such demonstration. This being so, I cheerfully accede to the request, if by so doing I can impart information or render any help, even in a small degree.

I shall endeavour to treat the subject under three heads, viz., "Formulæ, and what to avoid;" "Modus operandi, and dangers incident thereto;" "Peculiarities in development, and their accompanying circumstances."

Firstly.—Formulæ, and what to Avoid.

Primarily I would say, hereon, "Adhere to what is simple, and when you get a good formula that suits you in all respects, stick to it."

Gelatine plate-making requires much system and as much uniformity as is possible, so that by often searching for novelties, or being led away by much-belauded formulæ, when one is already working a process which gives certain and reliable results, there is great danger of sacrificing a certainty for an uncertainty, and wasting much valuable time, which, in the present day, I am sure no one can afford to do.

The formulæ may be classed under two heads, viz., those involving digestion, and others, boiling. The former has been a very favourite method for somewhat slow plates, but I cannot help recommending those desirous of making plates to adopt the latter course, viz., boiling where possible, because much time is thereby saved, half-an-hour or so taking the place of twelve or fourteen hours; greater certainty is assured, the temperature during digestion sometimes creeping up in a most unsatisfactory manner during the operator's absence, the emulsion being thereby damaged; and for a business man, it is far more convenient, as the whole operation can be completed during the leisure of an evening, when in the other case the stoppage of the digestion arrangements for setting, &c., &c., have to be conducted very often at a time when one's thoughts are being drawn towards the shortly-to-be-encountered business of the day, resulting in hurry and a want of deliberation, not conducive to careful and satisfactory manipulation.

Of course in a paper such as this it is impossible to go into the thousand and one varieties of modes of getting more or less at the same end, especially as, to a certain extent, one must perforce be guided by the difference of taste regarding speed, colour of plate, mode of development, &c. I may, however, give my own ideas as to the class of formula which is, taken altogether, the most desirable.

I do not feel at all drawn to those formulæ which include amongst their ingredients chloride, for my experience has been that the result is a cold, grey colour, neither pleasing in appearance, nor facilitating the judgment of density. I have found the most reliable plates, and those possessing most vigour in every respect, accompanied by clear shadows, and a general appearance of pluck, together with a rich warmth of colour in the resultant negative, have been prepared with an emulsion containing iodide; and, so far as my own practice is concerned, I see no prospect of my omitting this from my emulsions. The negatives I have brought for your inspection are those from which my pictures exhibited at the Bristol International Exhibition were printed; and I think I may say that they are more of the wet-plate class of negative than a good many gelatine negatives one sees, alike as regards colour, clearness, and general pluck. They were all prepared with an emulsion containing iodide.

Another important point—in fact, the all-important one—in the make of the emulsion is the complete, rapid, and yet steady admixture of the bromo-iodide and silver. For this purpose, various nicely-constructed rapidly-revolving whisks and emulsion vessels have been constructed; but I consider we are all of us greatly indebted to the mode lately introduced by, I believe, Mr. Burton, and which method commends itself to me as being the most perfect, and almost automatic, that we could possibly possess. Instead of pouring the solution of bromo-iodide into that of the silver, the dry silver in crystals is placed in a hot stone bottle, all the bromo-iodide solution is poured into it, and it will at once suggest itself to you that only as the crystals

dissolve can the compound be formed, and thereby a steady and complete mixture is formed, only requiring vigorous shaking till the crystals are heard to rattle no more. I have been exceedingly pleased with this new idea, and can most certainly say that the results, as regard fineness of film and regularity, have been in my hands all I could desire.

We next come to a point upon which it is quite impossible for anyone to make any definite statement, with reference to what is correct or what is incorrect, each class being most desirable and suitable in its respective sphere—I mean the rapidity of plates.

For my own part, I prefer for general landscape work a plate of about five times the rapidity of an average wet plate; but I am inclined to think that much beyond this involves the danger of a probable loss of pluck and clearness in the shadows; also an absence of latitude in exposure and treatment very desirable as qualities in a plate for general landscape work. Of course, I do not for a moment under-estimate the great value in frequent cases of rapid plates, and always take a few with me when out for a day's photography.

MODUS OPERANDI, AND DANGERS INCIDENT THERETO.

Under this section I shall have to say but little—that is, not accompanied by demonstration, so that if it be somewhat disjointed, I must beg you to excuse it.

I need hardly say that one of the most important points in connection with the actual operations is extreme cleanliness. This requires more care and promptitude than in many other branches of the art, as particles of old emulsion are very liable to stick to and remain on dishes, vessels, &c., thereby causing mischief to fresh batches of emulsion, and being in frequent cases the cause of the failures so exercising the minds of operators. Great care is necessary in the choice of gelatine, and samples containing any grease (a most general defect) should be discarded in favour of those of purer quality, which should be both hard and soft, and mixed in the proportions which a few experiments will soon determine as the best suited to the manipulation and requirements of the operator. I find no brands of this material superior to Heinrich's and Nelson's X for hard kinds, and Nelson's No. 1 for soft; there is, I believe, another of this latter class made at Wintherthur, in Switzerland, which is also very good, but I have not tried it. There are three things which a would-be plate-worker should have arranged at the very outset of his endeavours, as being absolutely necessary for convenient comfort in working (and I maintain no man will succeed who is not comfortable in this work). These are a good levelling-cupboard, a spacious drying-cupboard, and a light-tight cupboard. You may say, why a cupboard for levelling? Would not a large slab do equally well? A slab would answer the purpose, but would not do anything like so well, for if on any emergency you should be called from your room when coating, you have only to close your levelling-cupboard, when everything is perfectly safe till you return to complete the operation; this is a matter of great convenience. And while on the subject, I may say that such cupboards should open and close easily, and with no make-shift fastenings, for it sometimes happens that one wants to get out a plate from the drying-box to test it in a hurry, and unless the fastenings are simple and sure, it is very probable that the result will be a number of plates fogged whilst in the drying-box.

I may, perhaps, with advantage, describe these two boxes. My drying-box is a little above the ground, say one-and-a-half feet, and the levelling-box above. The latter is fitted with six shelves, each accommodating six 10 by 8 plates, making a total of three dozen. The shelves are arranged in such a manner that on closing the box it at once becomes an additional drying-box. As it is connected with the drying-box, and the air, after passing through it, passes over shelf after shelf, from alternate ends, the upward current being caused by a Bunsen burner in the outlet at the top. The drying-box proper holds nearly sixty 10 by 8 plates on edge, in two rows.

I will now make up a small quantity of emulsion, remarking, as a caution, that before commencing this operation the manipulator must be careful to see that he has everything well arranged and at hand, so that when in the dim light necessary to success, but none the less awkward for working by, he shall not have to hunt and grope about for things with the certainty of breaking not a few.

[Mr. Daniel then fully described the mode, and gave a demonstration of the making of gelatine emulsion and coating plates with his revolving coating machine, and concluded with a few remarks on the development of gelatine plates.]

FERRO-OXALATE FOR COLLODION DEVELOPMENT.

BY H. L. T. HAAKMAN.

SHOULD there still be any photographers, amateurs or otherwise, practising dry collodion plates, it may perhaps interest them to know that the ferro-oxalate developer is excellent to initiate the development.

On Saturday I prepared some dry coffee plates, to experiment with on Sunday. As a rule, I always started the development by immersing the plates in a solution of plain pyrogallic in water, and gave them the necessary strength by after-treatment with acid pyrogallic and silver. My first plate was evidently much under-exposed. It then struck me to try what ferro-oxalate would do. I took a second plate, prepared with the same collodion, exposed it as long as the first, and immersed it in an old ferro-oxalate solution, restored by placing it for some time in sun and daylight in a well-stoppered white bottle, tartaric acid in water having been added to the original solution. The image sprang up almost immediately; it was, however, too weak for printing, but after having been washed, it intensified rapidly with acid pyrogallic and silver. I then took a few more comparative trials, and found that wherever the exposure had been sufficient to give a good image with the old method, the negative developed with ferro-oxalate looked much "riper." But in no case did I succeed in getting in the first instance a negative of sufficient printing density. My success with ferro-oxalate for dry plates emboldened me to try it this morning with wet plates, but to little or no purpose. My first plate, treated with the plain ferro-oxalate, was, as I expected, a perfect failure—one mass of fog, and all sorts of deposits and streaks over the plate, with, however, a rather strong negative underneath. The solution was almost blackened by a somewhat voluminous silver precipitate.

Plate No. 2 was first thoroughly washed after it had been sensitized, and then exposed. It gave an under-exposed rather foggy picture. Plate No. 3 was sensitized and exposed in the usual way, but not washed. It was developed, not by immersion, as No. 1, but by flooding it from a developing cup with ferro-oxalate to which plenty of acetic acid had been added. Result, nearly as bad as No. 1. Plate No. 4, exposed for the same time as No. 2, developed with a strong sulphate of iron developer, gave a perfect picture. These experiments prove:—

1. That ferrous oxalate is a bad developer for wet plates when free silver is present, and only an indifferent one when the same has been eliminated.

2. That it is a good developer for dry plates where no free silver is present.

To conclude, I hope I may live to see the day when collodion, either by a new mode of sensitizing or a more powerful developer, will stand in the front rank again, and leave gelatine behind it. Collodion negatives have undoubtedly a beauty of their own unsurpassed by gelatine; with only common care they keep for years. This is more than can be said for gelatine; the so-called instantaneity, which finds its application in exceptional cases, does not always work for good, and is just as often an evil. Moreover, the plates are troublesome to prepare, and very expensive to buy.

Correspondence.

PROVINCIAL EXHIBITIONS.

SIR,—I do not know why the "By-the-Bye" in your last week's issue was headed *Provincial* Exhibitions, for the criticisms it contained were quite as applicable to the London exhibition as to provincial ones. However, I am not going to quarrel over this, or I could say something on the other side. There is a question raised as to the definition of a "landscape," but I should like to know what the

definition of an enlargement is. There is very often a medal given for the best enlargement, and it would be interesting to know who is legally entitled to such an award. At Bristol, Mr. Donkin was awarded a medal for an enlarged Alpine scene, but as it turned out that only the original negative was Mr. Donkin's, and he had not done the enlarging, the medal, I believe, was afterwards withdrawn.

Now I do not think Mr. Donkin was entitled to the medal, if this was "for the best enlargement," but I ask, who is? I apprehend if I take a fine negative and afterwards make a fine enlargement of it, that I could then justly take such a medal; but I want to know if I can take the medal if I only do the fine enlargement and not the fine negative. What do your readers say to that?

If it is meant that the medal is given "for the best process of enlarging with an illustration," then I contend that undoubtedly I am entitled to the medal if I only do the enlargement successfully. I have but to look out for a friend who has taken a very fine negative, borrow it for a few days, and enlarge it. But what I want to know is: Shall I be entitled to the medal in these circumstances, if it is given "for the best enlargement"? The jury then might want it back again; they might say, "Yes, yours is a very fine enlargement, it is full of power and harmony, but, you see, the original negative is not yours. A negative is at least as essential in the making of an enlargement as are enlarging apparatus and manipulative skill, and therefore as only the latter are yours, and not the former, we cannot give you the medal." Now is the negative an element in the enlargement? is the point that is at issue. One answer to this is undoubtedly yes, because no jury ever yet gave a medal for an enlargement in which the negative was not a first-rate one. My own humble opinion is that honours should be divided; the taker of the negative is not entitled "wholly" to the medal, but neither is the person who does the enlarging "wholly" entitled to it, for he would never have received the medal had he not had an excellent negative. But possibly some of those who have more experience of exhibitions entertain a different view to yours truly,

An Exhibitor.

MICRO-PHOTOGRAPHY.

Dear Sir,—I beg to thank Mr. Jennings for his lengthy exposition of the errors in my paper, most of which, however, are not due to myself, and they would have received correction had a "proof" been sent me.

"As regards the practical part of my paper," I have found my bellows-camera, eighteen inches long, quite sufficient for recreative purposes with the microscope. The paper in question being addressed to beginners, and, in the first place, to the amateurs of this district, as a hint towards utilizing long winter evenings, I considered that directions for using a quarter and half-inch focus would meet all the requirements of the case.

Funny, too, as it may seem to my critic, I have even had occasion to expose two whole hours before getting anything like an impression from a dense logwood-stained slide; but, of course, an exposure like this is the exception, and not the rule.

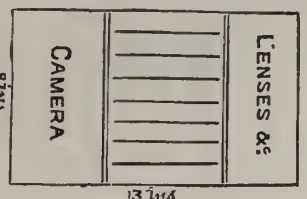
To conclude. As I do not suppose that the amateurs of North Staffordshire intend coming out as professional photo-micrographers, perhaps, while greatly appreciating Mr. Jennings' good intentions, the few hints which I gave towards making an occasional evening agreeable may be as useful as the long list of his glorious achievements.—I am, dear sir, yours, &c.,

W. B. Allison.

North Staffordshire Infirmary.

A TOURIST CAMERA WANTED.

Sir,—It may assist your correspondent Mr. Waghorn, who asks about a tourist camera for 8 × 5 plates, if I describe one that size which I have just had made by Meagher. It is strongly made for use, nothing having been sacrificed to obtain excessive lightness. With eight double backs, box containing six symmetrical lenses, tripod-top, and focussing-cloth, packed in a strong leather case, two all-round straps and handle, lock and key, it weighs fifteen



Plan of Case.

pounds, and measures 13 × 8 × 11 inches. For the benefit of tricylists I may also mention that it is carried very comfortably on a Rudge Coventry Convertible, either in its single or double form, the stand being strapped on the side bar. Of course it might be made four or five pounds lighter, but for work in distant countries, out of reach of repairers, I do not think that it is too strong or heavy. It can also, if wished, be packed in two nearly similar cases, the backs in one, and the camera, lenses, &c., in the other.

Russell Sedgfield.

THE ETHER-OXYGEN LIGHT.

Sir,—In reply to the letter of Mr. Frank Ives, I thought it was clear, from my phraseology, that I was writing of his ether generator solely from the description in the catalogue; but if not, I hasten to put that beyond doubt. The paragraph which occasioned my remarks reads as follows:—

If, when the oxygen key is closed to turn out the light, the lime continues to give a bright light, even after the saturator is turned on its side, it is an indication that the supply of ether is almost exhausted. This need not occur, because the saturator *will hold more than enough* to supply a suitable proportion for an ordinary size bag of oxygen; but if it does occur, the flame will give a harmless "snap" when turned out, or retreat into the saturator and blow off the rubber caps if the pressure of oxygen is insufficient. In the latter case the flame could be instantly smothered with a handkerchief, and no damage would be done.

I must leave it to the reader to decide whether my comment amounted to any "misrepresentation," intentional or otherwise; adding that the operator is further cautioned to commence with a full supply of ether, and "do not waste it by burning the ether flame alone." I happened to know that porous generators have been abandoned by several experimenters in this country from the deficiency of supply; and with this caution, the assurance that there was "more than enough for an ordinary size bag" brings the supposed accident, to me, uncomfortably within a measurable distance. I stated the superior safety of the porous method in one point, against what seemed to me its special danger in another; and whether I am right or wrong, the whole case is now before the reader.

As regards the latter part of Mr. Ives' letter, we must remember that with any apparatus, no accident will happen unless *something* has been forgotten, or has gone wrong.

Lewis Wright.

WANTED, A PRINTING PROCESS FOR INDIA.

Sir,—I am an amateur photographer in the jungle in India, and am rather puzzled what printing process to use. I work two sizes, usually 4¼ by 3¼, and sometimes 10 by 8, and generally want only six to twelve prints off each negative. My duties necessitate my continually moving about, and I am generally half the year living in a small tent, and consequently want a simple process.

I have tried silver, but I believe it fades out here; besides which, it is messy. I failed with carbon chiefly on account of the difficulties of drying the tissue, hav-

ing no proper room, and not being able to carry any heavy or bulky drying-box. Platinum I have tried with but moderate success, and could not get pure whites, owing, I believe, to the paper not keeping in this trying climate, and the difficulties of sensitizing appear to be as great as those of carbon.

Under these circumstances I would be much obliged for suggestions. It is too much to ask for details of a suitable process, but I would be glad if anyone would let me know what process is likely to do, and where I can get full information about its practical working,—Yours faithfully,

ASSAM.

Gauhati, Assam, India, March 20th.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

SIR,—Allow me to correct a misstatement in last week's issue. Mr. Lang's paper on "Poitevin's Photo-Reliefs" was read before the above Association, and not the Amateur Society.—Yours truly,

J. CRAIG ANNAN.

RAPID PLATES FOR PHOTO-MICROGRAPHY.

DEAR SIR,—In support of my assertion last week, that rapid plates answer well for photo-micrography, I beg to send you specimens taken on very rapid plates.

The photographs are as follows:—No. 1, palpi of garden spider, ¼-plate size, Swan's "30 times collodion;" exposure one minute, small microscope lamp, two-inch lens, and eye-piece. No. 2, wing of midge, *Psychoda*, same plate, lens, and exposure. No. 3, a very small *Triceratium*, 5 by 4 plate, also Swan's, lens $\frac{1}{16}$ inch imm., without eyepiece, camera expanded about five feet; the intercellular dots are shown sharply; exposure about ten seconds to magnesium ribbon supported in a holder; × about 800. The minute size of this *Triceratium* may be imagined from the fact that it did not half fill the field of the $\frac{1}{16}$ inch. No. 4, male flea, *Pulex irritans*; rapid ½-plate—too rapid in my hands for landscape work—by Messrs. Mayfield, of Nottingham, lens 2 inch, and eye-piece. A very yellow object, so an exposure of seven minutes was necessary. In all these photographs, I think you will find that the definition has suffered neither from the rapidity of the plate, nor from the size of the enlargement.

Judging the correct exposure certainly presents difficulties in this, as in any other branch of photography; but when one's "hand" is well in, and when using familiar lenses, one is rarely wrong, for artificial light is far more uniform in actinic quality than daylight. Were I asked what is the most difficult part of microscopic photography, I should unhesitatingly reply, *the proper illumination of the object*, especially with high powers. Anyone can put on a blaze of light, even with a $\frac{1}{12}$ inch, or $\frac{1}{16}$ inch; but that is not illumination.—I am, sir, yours faithfully,

I. H. JENNINGS.

[The micro-photographs Mr. Jennings sends us are excellent.—ED. P.N.

Proceedings of Societies.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

A MEETING was held in the small room attached to the Gallery, 5A, Pall Mall East, on Tuesday, the 22nd inst., Mr. WILLIAM BEDFORD in the chair.

Some interesting examples of platinotype printing on linen were handed round by Professor Donkin. The prints were made by Dr. Huggins, and after having been moistened with glycerine, they had been mounted between glass plates so as to ensure optical contact. They resembled ordinary silver prints mounted on glass with gelatine in the usual way.

Mr. COWAN exhibited a plate-book very similar to that figured on page 58 of our second volume (1859), except that the leaves consisted simply of thick paper instead of light frames. The closed book is fitted into a paste-board case, and this first case slides into a second, so that light is effectually excluded.

After some general conversation on the subject of packing plates,

Mr. LYDDELL SAWYER read some notes on the recent exhibition of lantern slides, and it was afterwards suggested that it would be interesting for the Society to obtain some slides from the extensive educational series published by Dr. Bruno Meyer, of Carlsruhe, his series comprising more than 4,000 photographs.

The CHAIRMAN asked if anyone present had acquired further experience as to the methods of slide-making, illustrated at the last meeting, and he made special reference to Mr. Wellington's method of obtaining various tones on gelatino-bromide plates (p. 79). He rather thought that Captain Abney had broken ground in that direction some years ago.

Captain ABNEY remarked that it was easy to go farther back, as Colonel Stuart Wortley had long ago noticed something of the kind in connection with collodio-chloride plates, the colour of the image being brownish or greenish, according to the rapidity with which development was carried on.

Professor DONKIN had not been very successful in obtaining variation in colour on gelatino-chloride plates; but

Mr. COWAN suggested that he had not varied the exposures so as to accord with the different methods of development. Mr. Cowan said that, even when 280 times the normal exposure had been given, it was possible to control the development by 16 grains of bromide to the ounce of developer.

The production of reliefs on gelatino-chloride plates, as described by Mr. Francis Cobb (page 175), was then referred to.

Mr. PEEK said he had not only obtained well-defined reliefs, but he had been successful in inking them up after the fashion of a collotype plate.

Captain ABNEY referred to the analogous method with a bromide plate, which had been suggested by Mr. Swan, and to Warnerke's method, in which the gelatine of a gelatino-bromide film is washed away from the unexposed side, after the fashion of carbon printing.

Mr. B. P. LASCELLES, who is now engaged in carrying out some experiments on phototype work for the *Clarendon Press* at Oxford, made some remarks as to the progress of photo-mechanical printing, and said that practical men would welcome any improvement which enabled a relief or fatty transfer to be made with increased speed and certainty.

The meeting was then adjourned.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 17th inst., Mr. W. K. BURTON in the chair.

After the usual routine business had been disposed of,

The CHAIRMAN called upon Mr. W. E. Debenham to deliver his lecturette (see page 262). He (the Chairman) said Mr. Debenham had been very explicit; while avoiding slovenly statements, he had also drawn the line in the other direction, by avoiding mathematical formulæ, which was like the dead languages to the ordinary photographer. There were a few points on which he would touch. To determine the focus of a lens precisely enough for practical purposes, he focussed a distant object, generally a row of electric lights; he then measured the distance between any two lights, removed the lens, and inserted a diaphragm $\frac{1}{16}$ of an inch in diameter. The camera was then racked out until a similar image is obtained, the distance between the ground glass and the stops representing the equivalent focus of the lens. He endorsed Mr. Debenham's remarks on flatness of field; opticians sacrificed flatness for microscopic sharpness, leaving marginal rays out in the cold.

Mr. J. TRAILL TAYLOR understood Mr. Debenham to say that flatness of field, along with comparative freedom from astigmatism, was not possible when using large angular apertures. But there was a means of overcoming the difficulty, which he would illustrate on the blackboard. About eleven years ago Prof. Piazzi Smyth studied the problem, his desire being to get an absolutely sharp picture on a small scale with the full aperture of a quick-acting portrait-lens, and afterwards enlarge it further. The manner in which Prof. Smyth overcame the difficulty was by placing a plano-concave lens close to the plate, by which marginal rays which, under ordinary circumstances, had a focus short of the plate when the axial rays were in focus, were received on the concave side of the lens, and transmitted in a more or less parallel manner, afterwards converging to a focus, and thus becoming lengthened. He found the effect of a lens so placed was to

immediately obtain good marginal definition on a flat plate. The cost would operate against very large size plates being used. The path taken by the rays was shown on the black-board. Speaking on lenses generally, Mr. Taylor was of opinion that the lens of the future would partake of the nature of a dialyt, one example of which was to be found in Petzval's orthoscopic combination as constructed by Voigtlander, and now supplanted by others. Only a few days ago he was engaged in some experiments in which a bi-concave crown and a meniscus flint, the combination being negative, was so arranged in a tube that these glasses could be easily separated. By very small degrees of separation, they gave an image on either a hollow or a flat field; not only so, but by separating them still further, the field of delineation became bellied. He exhibited the lens referred to, and said that he had just adapted it to a mount along with some other lenses, by combining which he obtained any focus from three to seventeen inches, thereby reducing the weight of his outfit to a minimum. Pictures taken with a fifteen-inch lens gave about the same effect of a scene as when examined by the eye in nature; beyond this focus the picture would be telescopic. Large pictures could be taken with a small expansion of body if the posterior lens were concave, and constructed according to the dialytic principle to which he had alluded. In connection with spherical aberration, he said that the large amount of glass in objectives of the modern rapid type requisite to secure deep contact surfaces suggested the subject of American lenses of the same type. In 1861, Sir John F. W. Herschel published a paper in which he gave a series of diagrams with curvatures showing how to obtain lenses free from spherical aberration, and it was interesting to know that, subject to certain obvious modifications, one form has been adopted by Morrison, of New York, for his rapid group lens; while another had been adopted by Dallmeyer for the back of his patent portrait lens. The Morrison lens was the American rival of all those formed on the Steinheil aplanatic system, whether designated rectilinear, symmetrical, or Euryscope; but it differed from those in being constructed with shallower curves, and of ordinary crown and flint glass. The wide angle lens of Morrison's was the outcome of the Harrison globe-lens, its front being formed of a deep achromatic meniscus, while the back was a single crown lens of similar form.

M. J. Cadett was of opinion that very few lenses would be found to do practically what is theoretically expected of them. Even theory, as published in the text-books, was sadly wanting. He had searched in vain for definite information in the works of recent date. The best information he could find was in a treatise by Monckhoven. A thoroughly practical treatise was badly wanted. He believed, with the Chairman, that marginal definitions might be improved. Those who made mathematics a study did not seem much better off as regards lenses. Ninety-nine out of every hundred photographers know nothing of mathematics, and those who profess to teach them, know very little more about it. Mr. Warnerke, who is a good mathematician, recently went through laborious calculations, and finally came to the conclusion that mathematical calculations were so much useless labour; he now trusts to practice. He did not think the Chairman could see more than one or two degrees sharp with the eye; 30° would be a general outline not sharp.

Mr. F. Hart would not like the discussion to pass without calling attention to Mr. Taylor's diagram of the plano-concave lens. He did not suppose it would be constructed for whole or half-plates; but if it were practical to get three inches absolutely sharp, an immense power would be gained. When lenses do not give sharp definition over the field, presentable enlargements cannot be expected.

Mr. A. L. Henderson asked what effect would be obtained if the plano-concave lens was brought nearer the negative?

The Chairman: It is doubtful if the same result would be attained; it must be borne in mind that rays once brought to a focus would not disperse afterwards.

Mr. Henderson questioned the lecturer as to the effect of introducing the front combination of a whole-plate lens on the back of a small portrait lens—hung on, not centred.

Mr. Debenham should expect to get confusion.

Mr. Henderson had thousands of negatives taken in that way. Working a short studio some years ago, he used to take half-length cartes with a 1B, and hung the front combination of a French whole-plate lens on to get full-length figures without having to move the camera further back.

Mr. A. Haddon said that among those who had studied mathematical science, it was surely possible to find a sub-committee who would study lens-grinding and polishing, and report thereon.

Mr. W. Coles: Does the Chairman get an image sufficiently sharp for practical purposes in his method of ascertaining the equivalent focus of a lens?

The Chairman: It is not necessary that the image be sharp for this purpose; it will be sharp enough.

Mr. Cowan said Mr. Warnerke's method is to mark the tube, taking the sun as the object; then turn the lens, taking the same object the other way; dividing the two would be the equivalent focus of the lens.

The Chairman said they had received, what he anticipated, a most instructive and interesting paper from Mr. Debenham, and he moved a hearty vote of thanks to Mr. Debenham, which was carried unanimously.

It was announced that the next lecturette will be given on May 8th—"Science of Polarized Light," by Mr. C. Darker.

Glasgow Photographic Association.

The twelfth general meeting of the session was held in the Religious Institution Rooms on Thursday, the 10th inst., Councillor Robertson in the chair.

The minutes of the last meeting were read and confirmed.

Mr. Wm. Lang, Junr., then read an interesting paper on Poitevin's photo-reliefs, and showed a number of very fine specimens of work, which were much admired and freely criticised.

The President, in a few words, thanked Mr. Lang for the great trouble he had been at in getting up the paper and illustrations.

The next business was the nomination of office-bearers for the ensuing session, to be elected at the next meeting. This having been done,

Mr. McGhie exhibited a number of magic lantern and window transparencies, printed by contact on Cowan's gelatino-chloride dry plates. Mr. McGhie said the process was exceedingly simple. The specimens before the meeting were the first experiments he had made with the plates, and they were satisfactory in every respect. In his experience he had found magnesium to be the most suitable light to print with. One and a half inches of ribbon, burnt at seven inches from the frame, was sufficient exposure for an ordinary negative. He also showed a new combined shutter and sky-shade by Guerry. The shutter had two flaps, one of which covered the sky for a certain part of the exposure, which time is regulated by a little lever.

The meeting terminated with a vote of thanks to Mr. McGhie and the Chairman.

Photographic Society of Ireland.

The usual monthly meeting of this Society was held on Friday, the 18th inst., in the Royal College of Science, Stephen Green, Mr. Mayne in the chair.

The minutes of the previous meeting having been read and confirmed, Dr. Robert Brown and Mr. James Robinson were elected members.

The Chairman then called on Mr. Watson for a communication entitled "Retrospect." In his remarks, Mr. Watson gave a short *resumé* of photography from its earliest stages, tracing out the various improvements that had from time to time taken place up to the present time. Mr. Watson's paper was most interesting, and elicited a well sustained debate.

Mr. J. V. Robinson gave some valuable information on the various methods of enamelling. In Mr. Robinson's hands the process of coating a previously chemically clean plate of glass with collodion, then applying a coat of best negative varnish, and over that a thin layer of gelatine, and lastly pressing the print on same and squeegeeing the air-bubbles out, had worked the best, the enamel proving tougher, the surface of collodion apparently not being so easily damaged as when the application of varnish is omitted.

Dr. Scott exhibited and explained a very simple and ingenious form of actinometer which he had made. He had taken two pieces of sensitized albumenized paper, and exposed one to the action of the light for thirty seconds, and the other for one minute. The colours thus procured were then accurately imitated on a piece of glass. The *modus operandi* is as follows. When an exposure is to be made in the camera, take out a small piece of paper and expose same until one or other of the colours

has been obtained, noting the time necessary to secure the change. The paper thus acted as a standard, thirty seconds on one occasion having been found to be the correct exposure for the plate, and by making a simple calculation each time the proper exposure for the plate was secured. Dr. Scott had tried this on several occasions, and had never found it to fail.

Mr. J. V. ROBINSON exhibited a whole-plate camera made by himself, also a new camera-stand, the chief merit being the method of shortening the legs, the bottom or single lath sliding between the two upper laths, and being clamped by a band of brass.

Mr. WATSON also exhibited a new 7½ by 5 camera—the various movements, as also the method of extending the base-boards, attracting a considerable amount of interest.

The next and last meeting for this session will be held May 9th.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THIS Society held its monthly meeting at 181, Aldersgate Street. The minutes of the previous meeting were read and confirmed.

Mr. J. R. Nisbett and Mr. J. F. Lattimer were proposed and elected members of the Association.

Attention was called to a paragraph in the PHOTOGRAPHIC NEWS of March 14th, suggesting that paid canvassers should be engaged. The matter received the consideration of the Board, but no action was taken.

The other business having been dealt with, the meeting adjourned until May 7th, at 8 o'clock.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—At the next meeting of the above Society, to be held at the Society of Arts, John Street, Adelphi, on Thursday, May 1st, at 8 o'clock, Norman Macbeth, Esq., R.S.A., has kindly promised some "Notes on the Composition of a Picture;" when it is hoped that not only will the members attend to welcome this eminent artist, but also make use of their privilege to introduce a friend.

PHOTOGRAPHIC CLUB.—At the next meeting of this Club on April 30, the subject for discussion will be, "On the Preparation of Lantern Slides." This being a Lantern night, members and visitors are invited to bring slides.

To Correspondents.

*** We cannot undertake to return rejected communications.

E. A. T.—If you copy a photograph without knowing whether it is copyright or not, you do so at your own risk.

R. M. L.—We should recommend you to melt the size, and then stir in one-fourth of its weight to a cold saturated solution of bichromate of potassium.

J. W. MORPETH.—1. We are inclined to think that the second lens you mention will be more suitable, as the figures will come out somewhat larger than if the first were used. 2. The lens already referred to, or some other instrument so nearly allied to it as to be practically identical, is generally used; but some prefer to use a portrait combination when small pictures are required.

J. W.—We quite agree with you that extremely beautiful pictures can be, and indeed often are, produced by the process you name; but we do not know of any means by which similar positives can be obtained on ordinary gelatino-bromide plates. It is quite true that you may make a thin negative and whiten it by immersion in a solution of mercuric chloride, but those clear shadows which form a peculiar charm of the old glass positive are likely to be wanting.

D. G. A.—Messrs Trübner and Co., of Ludgate Hill, will obtain the book for you. We do not know the cost, but the firm referred to will inform you as to this.

F. W. M.—It may be sufficient or insufficient according to the activity of the toning elements; but the method you refer to is of necessity uncertain. Why not adopt the usual plan of carrying on each process separately?

T. P.—It appears to us that all your pictures are over-exposed. Be careful to use a safe light in your dark-room.

F. COLBOURNE.—Ready-sensitized paper very frequently contains free acid, and this often prevents the toning. Add a few drops of ammonia to the last water in which you rinse the prints previously to toning them.

F.—The idea is absurd, but you should register the picture so as to secure the copyright properly.

E. J. RUSSELL.—If you tell us what the solution is composed of, we may be able to give some kind of an opinion as to whether it is likely to have caused the mischief.

MOUNTER.—No doubt some of the prints have been cut across the sheet, while others have been cut in the direction of the length, and the unequal contraction of the paper has occasioned the difference which you notice.

K. R. F.—1. The idea is perhaps a good one, only you should have made the negative sufficiently vigorous to give a white ground.

CHAS. GREENISH.—1. Judging from your description, we should think it is not a photographic objective at all, but a lens made for a magic lantern. 2. A mere trace of free nitrate of silver will do no harm, but you must be very careful not to have too much present. 3. Long heating has doubtless quite destroyed the setting properties of the emulsion. 4. Methylated spirit will answer very well.

H. P. C (Bradford).—The "stained red" glass can be obtained from Williams and Co., Glass Merchants, 36, St. Martin's Lane, Charing Cross, W.C.

THOS. GARSIDE.—1. We cannot but think that you either over-expose, or that diffused light reaches the plate. Examine your lens tube and the edges of the glasses with a view of detecting any surfaces which may reflect light. 2. Litmus paper will serve if you obtain a delicately-tinted sample, and observe carefully. Acids redden it, and alkalies change the tint to blue. You should select paper which is neither red nor blue, so that either condition may be detected. 3. Lay them one by one on a hard surface, and vigorously stroke the backs with the edge of a smooth and hard object, such as a paper-knife.

F. BENNETT.—Use a stronger solution of nitrate of silver for sensitizing.

ASPIRANT.—Judging from your description, we suppose that the lens is imperfect, and we would advise you not to purchase. If the local jeweller tells you that he can cheaply replace any glass which may be missing, it is probable that he is mistaken.

WHITE LEAD.—The idea is ingenious, but hardly practicable.

CARBON.—You will find all the information in the "Lessons on Carbon Printing" which are now appearing in the NEWS. 2. Add ten drops of sulphuric acid to each pint of the water used for mounting the exposed tissue.

MR. ROBINSON'S NEW BOOK.

PICTURE-MAKING BY PHOTOGRAPHY. Being No. V. of "Photographic Handy-Books" (See page 266, PHOTOGRAPHIC NEWS.)—Price 2/6, per post, 2/8.—PIPER and CARTER, 5, Castle Street, Holborn, E.C.

The Photographic News Registry.

Employment Wanted.

Operator & Retoucher.—A. D. Thissack, 1, Woodside-ter., Douglas, I. of M.
Retoucher (German), first-class.—30, Stean-st., Haggerston.
Assistant, well up in dry plates.—Photo., 148, St. James'-rd., Holloway.
General Assistant.—Z., Mr. Gregory, High-st., Marboro'.
Printer and Toner.—F. Knight, 40, Brooksby-st., Liverpool-rd., N.
Reception Room Lady in Lond.—M. A. S., 17, The Drapery, Northampton.
Operator & Retouch., first-class.—W. H. H., Art Studio, 3, Cheapside, E.C.
Operator & Ret., mod. salary.—Operator, 58, Campden-st., Kensington, W.
Photo. Colourist, gen. useful.—G. Manton, 49, Hurley-rd., Kennington-la.
Operator & Ret. in good house.—D. Prodger, The Broadway, Ealing, W.
Operator and Retoucher, could manage.—Artist, 1, Hove-st., W. Brighton.
Youth, as Assistant in dark room.—H. Eckhardt, 12, Bath-st., Brighton.
Mounter & Cutter (lady).—B., 1, Great Coram-st., Russel-sq.
Recep.-Room, Printing, Colouring.—E. M., 1, Benhill-rd., Camberwell.
Improver, can Tint well.—A. H., 15, Arlington-rd., N.
Reception-Room, Spot, Mount, &c.—E. H. H., *Photo. News* Office.
Ret. & Assist. Operator.—M. G. A., 1, North-pl., Montrose-st., Glasgow.
Print., Spot., Toner, Mounter, &c.—Miss Smedley, 45, Gt. North-ter., Linc.
Photo. Colourist and Retoucher.—Photo, *Photo. News* Office.
Recep.-Room, 7 years' experience.—E. Smith, York House, Cheltenham.
Spotting, Mounting, (lady)—K. B., 67, Colvestone-crescent, Dalston.
Retoucher, Recep.-Room, Spotting.—2, Marion Villas, West-st., Bromley.

Employment Offered.

Assistant in Stock-dealer's Warehouse.—Ruby, *Photo. News* Office.
Oper., clever with children & retouching.—Clayton, 6, Lond.-rd., Leicester.
Printer, with first-class references.—Stiles, 8, Kensington High-st., W.
Operator, Retoucher, manage branch.—C. Keeping, 1, Exe-bridge, Exeter.
Out-door Operator, first-class.—Taylor, 70, Queen Victoria-st., E.C.
Operator for Studio.—Hills and Saunders, Eton, Bucks.
Ferro Oper., to travel.—Mr. Griffith, 5, Northampton-bldgs, Clerkenwell.
Lady, exp., Recep.-room.—Hughes & Mullins, Regina House, Ryde, I.W.
Printer, well up in vignetting.—Winter, Midland-rd., Derby.
Oper. & Retoucher, good at lighting & pos.—Shrubsole, Davy-pl., Norwich.
Printer & Gen. Assist.—E. R. Gyde, Cheltenham House, Aberystwith.
All-round Hand (single).—Cuckney and Co., Rochester.
First-class Floater.—Tavistock Works, Tavistock-pl., Kensal-green.
Printing, Toning, &c.—Personally, 67, Pentonville Road, N.
Assistant Silver Printer.—W. N. Malby, Chichester.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1339.—*May* 2, 1884.

CONTENTS.

PHOTOGRAPHY OF YELLOW, BLUE, AND OTHER COLOURS IN THE TRUE PROPORTION OF THEIR INTENSITY.

BY DR. H. W. VOGEL.

THREE weeks ago I communicated the fact that I had been able, after some eleven years of investigation, to prepare collodion plates which were at least eight times more sensitive to the yellow of the spectrum than to blue, and in support of this statement I forwarded to the Editor of this journal a photograph of the table of colours in my Manual, in which the blue, the yellow, and the rose were reproduced in the true proportion of their brightness. This solution of a problem that has been so long encompassed with difficulty created a good deal of interest in scientific and photographic circles, and its importance in connection with the work of reproduction was at once recognized. The Berlin Society for the Advancement of Photography, in consequence, decided to acquire the process for the purpose of publishing it for the general good.

In accordance with the above understanding, I now communicate the whole process. I will begin with purely practical details, leaving aside the scientific aspect, which has several times already been discussed by me in these pages. At a later period I will describe my experiments in more detail.

Ordinary portrait collodion shows the greatest sensitiveness in the dark blue region of the spectrum, falsely termed the indigo-blue region; only after a very long exposure is there any sensitiveness evinced in the green, yellow, and red.

In accordance with a principle which I was the first to expound, this sensitiveness for green, yellow, and red may be increased by certain bodies which absorb these particular rays. The greater number of these bodies act best on dry collodion, very few being suitable for the wet process. Eosine, however, is one of these bodies, but as in commerce there exist two kinds of eosine, it is necessary to make a distinction. The one is the yellow shade of eosine (the potassium derivative of tetrabromofluorescein), and the other the blue shade of eosine (the potassium derivative of tetraiodofluorescein); there are besides methylated, chlorinated, and nitrated products, which I have also examined. The nature of the action of these bodies I will remark upon later, merely premising that they are now in everyday use as dyes, although seldom met with in a pure state, being frequently mixed with dextrine, &c.; the impurities they contain acting prejudicially upon the silver bath.

A firm in Berlin—the Actien Gesellschaft for aniline products, whose address is: Schlesien Thor, Berlin—has been good enough to prepare some of these dyes for me in a purified form for photographic use. Both the yellow and blue eosine have been supplied to me, and I find that the latter gives rather more intensity than the former. Combined with an alkali, both of them show a magnificent fluorescence when in dilute solution; they dissolve easily in water, less easily in alcohol, and absorb very vigorously yellow-green and blue-green rays. Added to collodion in suitable proportion, they render this very sensitive to the above coloured rays, and upon this depends the principle of their sensitiveness to colour.

Besides these bodies, one termed cyanosine, which I have to thank Dr. Martius for, I have found exceedingly good as a sensitizer for yellow. This resembles eosine in so far that its absorption bands lie more towards the red of the spectrum, and for this reason not only produces a sensitiveness for green (as does eosine), but also sensitiveness for orange rays. Unfortunately, this substance cannot yet be obtained in a pure state in commerce. The Actien Gesellschaft, the firm I previously mentioned, only furnishes at present for photographic purposes the yellow shade of eosine, which is twice recrystallized; and this I would recommend in the meantime to all who desire to make experiment with colour-collodion. Very shortly the same firm will produce for photographic purposes also, erythrosine and pyrosine, and these will then be preferable to eosine.

If these colouring matters are tried with gelatine and collodion dry plates, it will soon be found that the former is at most only double as sensitive for the yellow of the spectrum as for the blue. Practically, this would be of little advantage, for the yellow in colouring matters is so dark in comparison with the yellow of the spectrum; as I have already shown, the sensitiveness for yellow must be, not twice, but twenty-five times more than the sensitiveness for blue, if, in the resulting photograph, the yellow is to appear more brilliant than the blue. Fortunately, more favourable results are obtained with collodion plates than with gelatine. Already, my first experiment showed me that it was possible to produce plates from eight to ten times as sensitive for yellow as for blue, and for this reason I naturally turned at once to the collodion process to reproduce colours in their true intensity.

My experiments with gelatine plates I will describe later.

The action of the colouring matters depends, however, as I have previously said, very much upon the composition of the collodion. If you take ordinary iodized collodion, and add to it about 5 per cent. of a solution of eosine or cyanocine (the solution containing one part by weight of eosine or cyanocine) it will be found under ordinary circumstances that there is but a slight increase of sensitiveness for yellow. For this reason I made experiment with iodized collodion containing various proportions of bromine, and these showed me that the sensitiveness for yellow increased with the proportion of the bromine salt added to the collodion. Obviously, therefore, success lay in the employment of a bromized collodion,

At the same time, I found that a small proportion of iodine was an advantage for general sensitiveness. When the silver bath from long use contains much iodide of silver, then a sufficient quantity of iodide of silver is deposited upon the plates, so that pure bromized collodion may be emptoyed. In the case of a freshly-prepared silver bath, however, containing a minimum of iodide of silver, it is well to add 5 per cent. of pure iodized collodion to your bromized material.

As a general rule, it may be said that the sensitiveness of bromized collodion plates containing eosine, and prepared in a fully iodized bath, is only one-third as sensitive for white light as ordinary portrait collodion.

Working Details.

No. 1. *Colour Solution.*—At present only two colouring matters can be recommended as obtainable in commerce, the yellow shade of eosine, and the blue shade of eosine. Half-a-gramme of the material is dissolved in 100 cubic centimetres of alcohol of 95°; considerable agitation is necessary to effect the solution. The undissolved residue is not used, but the clear solution must be decanted off.

No. 2. *Collodion.*—Two grammes of bromide of cadmium are dissolved in 30 cubic centimetres of alcohol; this is filtered, and one volume of the filtrate is mixed with three volumes of neutral normal collodion made with 2 per cent. of pyroxyline. For some purposes a denser film is more advantageous. This is obtained by dissolving 2½ grammes of bromide of cadmium in 30 cubic centimetres of alcobol, filtering, and mixing in the above proportion, but with 2½ per cent. collodion. A collodion of this kind flows with more difficulty, and is slower to sensitize in the bath. To 95 cubic centimetres of the above collodion are added 5 cubic centimetres of the eosine, or *colour solution*. The collodion keeps best in yellow bottles, and should be brought into daylight as little as possible. I may mention that an increase of eosine brings about no increase of sensitiveness for yellow, while it decreases the general sensitiveness of the plate. A lesser proportion of eosine decreases the yellow sensitiveness.

Silver Bath.—This is made up of crystallized nitrate of silver, 50 grammes; water, 500 cubic centimetres; iodide of potassium solution (1 : 100), 13 cubic centimetres; and glacial acetic acid about 6 drops, or until there is an appreciable acid re-action. Nitric acid is not to be recommended for acidifying the bath, as it acts too strongly on the colouring matter. It must be distinctly understood that eosine is decomposed by acid, and converted into a yellow pigment, which does not increase the sensitiveness for yellow. For this reason an excess of acid is to be avoided.

By reason of the danger of introducing impurities from the colouring matters now obtained in commerce, I do not recommend the sensitizing of these collodion plates in a bath used for other purposes. I prefer the horizontal bath, as it does not require so much liquid.

Developing, Intensifying, and Fixing.—The solutions in ordinary use for collodion will suffice here. The plates are treated like ordinary wet plates, and it is an advantage o the process that no strange operations are introduced. Those who can work the ordinary wet collodion process can work the colour collodion process. Pyrogallic intensifiers, mercury intensifiers, uranium and lead intensifiers, may all be employed.

Manipulations.

Preparation of the Plates.—It is best to gelatinise the glass plates first of all. One gramme of gelatine is dissolved in 300 grammes of warm water, filtered, and on cooling there is added 6 centimetres of a cold prepared chrome alum solution (1 : 50). The glass plates are first soaked in dilute acid, washed, put in a dish of distilled water, and then twice coated in the gelatine solution.

The coating with collodion is done in the ordinary manner, but the plates must remain rather longer in the silver bath, as the formation of bromide of silver is very slow. At least five minutes' sojourn in the bath is necessary, although in a stronger solution the operation is quicker. Before work, the dipping bath should be tested with litmus paper, and acetic acid added, if necessary.

In respect to the illumination of the dark room, one need not be very anxious. I recommend an orange lamp-shade. Eosine renders the collodion but little sensitive to red; if you keep your plate in the shadow, you may even use yellow light in the dark room.

Exposure.—As before mentioned, the sensitiveness of eosine bromide plates is about one-third that of ordinary iodized collodion plates. This affords the operator sufficient data to go upon. In the reproduction of coloured pictures—as, for instance, the table of colours in my Manual—the sensitiveness for yellow is not so apparent as one might suppose. Chrome yellow and ultramarine blue come out equally light. On the other hand, the action of the eosine in reproducing rose tones is very obvious. These are reproduced in their true tone value, or intensity. In other tints, such as the green, the action of the eosine is also very apparent.

If it is desired to lessen the action for the blue still more, then you have to photograph through yellow glass; only in making the choice some care is necessary. Yellow window glass, by reason of its defective manufacture, gives rise to unsharpness, and therefore I recommend yellow patent plate; with this, pictures of faultless sharpness may be obtained. But to secure the right shade of yellow is also an important matter. If you use too dark a yellow, the exposure is very long, while too light a yellow does not act upon the blue sufficiently. My plan is to test the glass with the spectroscope; but to those not accustomed to spectrum work, I recommend the testing photographically.

I do not mean to say that every picture should be taken through yellow glass. After some experience the photographer soon learns which medium is the more suitable. At the worst, a few experiments will settle the matter. It must be mentioned, however, that the yellow patent plate prolongs the exposure (often three-fold), as the best glass of this character absorbs not only blue, but also a portion of the yellow light.

I am in the habit of employing an aplanatic lens with colour collodion, which, with a full opening, gives me a sufficiently sharp and detailed picture. In the case of long exposures, a dark slide may be employed with advantage, which allows a second plate to go in front of the prepared one, and thus prevent the drying of the latter; this forward plate might be a yellow one.

The Second Silver Bath.—The plates, like those in the ordinary wet process, could be forthwith developed, if the bath was free from so-called organic defects; but, unfortunately, these are apt to arise by reason of impurities in the colouring matter which have been introduced into the bath. Plates sometimes show fog, and sometimes show a cloudy unequal deposit, running in streaks from margin to centre. The latter are worse than the former; they may be avoided, or at any rate diminished, by moving the plate vigorously in the bath. If, however, the bath is very strongly afflicted with organic matter, the only means of avoiding the action of these impurities is to employ a second bath, which may be termed the developing bath. The plate is dipped into this bath after the exposure, but before development. It is made up of:—

Nitrate of silver	50 grammes
Water	500 ,,
Nitric acid, sp. g. 1·22	4 to 6 drops

The plate is moved vigorously to and fro in this for two minutes, and thus the impure silver attached to it is washed off, and the eosine decomposed by the presence of the strong nitric acid. After this, development can be proceeded with without the chance of any of the above-mentioned defects. After a time the developing bath becomes impure, and then

it may be used as a sensitizing bath, first being neutralized, and again acidified with acetic acid. Care must be taken to test this bath also with litmus paper before use.

The Development.—As a rule, the plates are developed with the ordinary iron developer used in the wet process. But the same success may be obtained with an alkaline developer, and the latter has, moreover, the advantage that the organic impurities are less liable to give stains. In the case of alkaline development, only one silver bath is used. The exposed plate is first washed with distilled water, then put under the tap for five minutes, and then once more in the distilled water. It is best developed in a dish with the following solution :—

Carbonate of ammonia solution	(1 : 6)	2 cub. cents.
Bromide of potassium	,,	(1 : 4)	½ cub. cent.
Alcoholic pyrogallic	,,	(1 : 10)	1 ,,
Water			30 cub. cents.

If the exposure has been too short, the amount of carbonate of ammonia, which must always be freshly prepared, may be augmented.

THE MEISENBACH PHOTO-BLOCK PROCESS.

Our readers have already heard a good deal about the phototypic blocks which are made, under the direction of Herr Meisenbach, by the Autotype Company of Munich, and a most striking example of the excellence of the work was afforded by the portrait of Sarah Bernhardt, which we issued during November in last year. Dr. Pick informs us that the block from which the accompanying impression is printed, was made and printed from within five hours of the time the negative was finished.

That photo-blocks will, in the future, largely supersede wood engraving, there can be no doubt whatever ; and now that the photo-typographic blocks from ordinary gradated negatives are likely to be made on a large commercial scale, one may consider that photography enters on a new phase.

Hitherto the Meisenbach blocks have all been produced at the parent establishment in Munich ; but the necessary delay in production, consequent upon the distance, has not prevented their use by several illustrated publications in

London. We understand, however, that preparations are being made for opening a branch establishment here, and we can have but little doubt as to the success of the undertaking.

It is scarcely necessary to observe, that the quality of the prints obtained from an engraved block depends largely on the manner of printing, and as the large circulation of the Photographic News renders it necessary to print it on a quick machine, after the fashion of a newspaper, our readers will understand that we cannot put before them the best print which the block is capable of yielding.

THE WOODBURYTYPE PROCESS.

(Sixth Article).

The block and paper having been provided, the next step is to prepare the pigmented gelatinous ink in which the pictures are to be printed; or, indeed, to speak more accurately, cast or moulded.

The ink to be used varies considerably in its constitution, both as regards the amount of colouring matter which should be present, and also as to the quantity of gelatine to be used in relation to the water. The circumstance which will primarily influence the amount of pigment required is the depth of the mould, it being obvious that when the relief on the printing mould is considerable, a smaller proportion of colouring matter or pigment will be required than when the degree of relief is small. As regards the proportion of gelatine to be used, we may remark that not only will it vary according to the setting powers of the gelatine itself, but that in summer it is necessary to use a solution richer in gelatine than that which will serve well in cold weather.

The gelatine which we have found most suitable for the Woodburytype process is that known as "*Coignet's Silver Label*," and a jelly formed by melting one part of this in five parts of water may be taken as the basis of the gelatinous ink. Indian ink is ordinarily the main constituent of the pigment used, and the tone of an ordinary photograph may be imitated very satisfactorily by the addition of indigo and alizarine lake. Much trouble may be obviated by purchasing these pigments already ground, and in the moist state; but it is still more convenient to obtain Newman's "Colour for Carbon Printing" (24, Soho Square) all ready mixed to the required tint and tone.

In very hot weather, or when it is desirable to remove the prints from the mould rapidly, the gelatinous ink may be used of the full strength mentioned (1 and 5); but it will, in all ordinary cases, be better to dilute it with about half its bulk of water. Having melted some of the gelatinous mixture, the moist colour is gradually to be stirred in until it is estimated that a layer of the mixture as thick as the greatest depth of the mould, possesses just the depth of tone required for the dark shades of the picture. Of course, one can only make a very approximate estimate; but some kind of judgment must be exercised at this stage before testing the ink upon the mould.

We must now mount the leaden plate or mould ready for printing, and some kind of a press is required; but the beginner cannot do better than to use an ordinary Albion press, such as is used by letter-press printers, especially as such a press can be obtained without difficulty in any large town. A piece of moderately thick plate glass should be cemented over the platen of the press, ordinary elastic cement or marine glue being used; but of course it is necessary that both the glass and the platen should be well warmed, and the glass must be retained in position by pressure until the cement has set. A little plaster of Paris is now mixed to a stiff paste with water, and a bed is made of this in the central portion of the carriage of the press; this bed having been levelled off as evenly as practicable, the mould is set down upon it face upwards, and a sheet of the printing paper is laid over the face of the mould, after which the platen of the press is brought down steadily upon the mould. Under these circumstances, the excess of plaster is forced out, and the lead mould becomes set firmly in such a position that its upper face accurately corresponds with the plane of the glass-covered platen. The pressure should be retained on the mould until the plaster is thoroughly set. The pressure being now removed, the carriage is run out, and the mould is carefully inspected with a view of ascertaining if there are any projections corresponding to accidental defects of the negative. Such can readily be removed by scraping with the sharp edge of a piece of glass, and if there should be a plain border of more than a quarter of an inch round the negative, it is advisable to scrape out, through this border, some six or eight channels through which the excess of ink may freely escape.

Olive oil is now thoroughly rubbed over the surface of the mould with the finger, care being taken that at the moment of applying the oil, the face of the leaden mould is quite free from any trace of dew or moisture. After all excess of oil has been removed by careful wiping with a piece of oily flannel, all is ready for a trial with the gelatinous ink. A pool of the warm ink, sufficient to cover about half the diameter of the mould, is poured on, and a sheet of the prepared paper is steadily laid face downwards upon this, after which the pressure is applied. The excess of ink is forced out, and that included between the paper and the mould soon sets, and in a few minutes the paper may be stripped from the mould, carrying the cast with it, and it is now quite easy to judge as to any alterations which may be necessary as regards the composition of the ink.

If the extreme whites of the picture are tinted, it is probable that the pressure has been insufficient, or that the ink contains too much gelatine; while if the whites are clear, and the picture generally is too dense, the amount of pigment must be reduced by adding more gelatinous solution of the same strength as that just used. In actual practice, there is not the least difficulty in adjusting the composition af the ink to the special requirements of the occasion.

As regards the printing but little need be said, except that it is necessary to keep the ink melted by means of a water-bath, and before each impression is taken the block should be wiped over with the oily flannel. All the superfluous ink which exudes can be collected and re-melted, when, after straining through fine muslin, it is ready for use again.

When many prints have to be made it is usual to provide a number of presses, and to charge them in succession, so that by the time the last has been closed down upon the mould, the cast or print in the first is sufficiently set to be removed. When the presses are small, they are arranged on a circular table, which can be made to revolve before the person who is printing. It should be noted that in printing it is necessary that the paper should always be a little larger than the mould, and a mould will ordinarily yield from 250 to 300 good impressions. Before the prints are dry it is convenient to scrape off the accumulation of gelatinous ink which will be found round the edges, as this can be used again; and for drying the prints large sheets of canvas stretched on frames are convenient, the pictures being laid side by side on them, and the frames can be stacked up on each other.

The dried prints are immersed for a few minutes in a three per cent. solution of alum, rinsed for an instant in water, and once more dried. It is scarcely necessary to say that the object of the aluming is to render the gelatinous impression insoluble.

As regards trimming and mounting, we need say nothing, as no special precautions are required. Woodburytype prints are much improved by heavy rolling, as it is not desirable that any relief should be visible on the picture.

By-the-Bye.

LANTERN DISPLAYS.

Thirty years have gone by since Albert Smith was at the zenith of popularity, and attracted the *élite* of London to his popular entertainment at the Egyptian Hall. We have still among our dramatic relics a programme of his "Mont Blanc," with outline sketches of the "Grands Mulets," "Mur de la Côte," and other points on the route, sketches which represented the charming panoramas exhibited during his lecture, that so vividly helped the spectator, in his warm and cosy seat, to follow the mountaineer's risks and perils in search of the beautiful among the high Alps. Thoughts of Albert Smith came back to us the other night as we saw Professor Donkin's fine snow pictures upon the screen; you could have risen from your chair, and in two paces have mounted some of those huge blocks of crystal glacier, or have taken a turn up the tempting smooth snow slopes that stretched to your very feet. Here was the glittering region of crystals, that sad snow kingdom where the silent tread of mortal rarely penetrates, with its hoary-headed giants and white-headed peaks, brought down from its distant fastness, and placed before you in Pall Mall. Professor Donkin takes you an excursion round the Dent du Géant, now ascending some slippery peak to get a view, now crossing a rugged glacier; he actually bids you turn round and look at the track you make over the white satin-like slope, where your shoes have kicked up the snow.

On the same occasion, we were witness, too, of some charming scenes from leafy Devonshire, as well as several bold views of rugged hills in Wales, while interspersed were other illustrations more or less interesting. The avowed object of the exhibition was, indeed, more for the purpose of showing the results obtained in slide-making by different processes; and although this end was served but imperfectly—since slides of different quality were used to exemplify the different processes, and no close comparison could be made—it afforded a salutary lesson to all those who occupy themselves with lantern displays. And their number is legion, for there is no more delightful plan of exhibiting good photographs than by showing them in a lantern.

In fact, so important is the matter of lantern photography, that we cannot but think the time is not far distant when a popular entertainment not less famous than that of Albert Smith will be launched in the metropolis. Of course, the exhibition must be on very different lines to be successful now-a-days, and it must be something more than an ordinary Mechanic's Institution lecture. Given a clever and versatile comedian like the Mont Blanc explorer, some good music, and good decorations, an exhibition of photographs would be welcome both in town and in the provinces.

But this by the way. What we wish to do on the present occasion is to point out in a few words certain collateral matters which do as much to make or mar a lantern exhibition as do good and bad slides. A lantern exhibition is perforce an entertainment. It may be for instruction, it may be for amusement: but it must be interesting. An audience is readily moved, and is proverbially good-natured; it will forgive anything so long as it is not bored, and a lecturer, in conducting his entertainment, may do pretty well what he likes, if he is not dull and prosy. This fault an audience never refuses to condone.

The easiest way to escape offence in this respect is to be brief. During the winter and spring months there is at the Royal Institution every Friday evening a lecture at nine o'clock, the speakers being chosen, not because they can lecture, but because they are men known to the world. Some of these gentlemen are very sad prosers, but still the worst among them will come off with éclat if he makes an end of it punctually as the clock strikes, while an otherwise successful discourse is frequently wrecked by the lecturer keeping his audience half-an-hour beyond their time. Like a man who foolishly takes an encore after singing his best song, he is led on by the applause of a good-natured audience, and outstays his welcome. To be brief, then, and to be brisk if you can, are qualities that should be well remembered, if your object is not to bore an audience.

It is sometimes thought that if you have good lantern slides to show, anybody will do to explain them. In this case, it is the usual thing to enlist into the service a gentleman who can talk, and then leave the matter in his hands; this is a common cause of shipwreck. He talks, and talks, and talks, for he has now a most excellent opportunity, and the consequence is, a dull and monotonous flow of language that dazes the audience, and makes your slides a nuisance. Much better have some one who makes no profession to talk at all, and who, if he does stumble occasionally, is at any rate understood, and does not extinguish the interest of your slides with his garrulity.

Good slides are naturally indispensable, but as authors are usually kind to their own faults, it is well to take the advice of a small committee on their excellence rather than trust to your own judgment. Some people think every good photograph will make a good lantern slide; and others, again, believe that no matter by what process they are produced, they may all be put in the same series, as if uniformity were of no consequence whatever in respect to density of film or proportions. Portraits make excellent slides, but must be used sparingly, otherwise they grow wearisome; put in here and there, however, they are very welcome.

We have said that good photographs do not necessarily make good slides. The fact is, that until you see a picture actually in the lantern you cannot well appraise its value as a slide. It must have breadth, and details, and interest. Therefore, the best plan of judging is, we repeat, by means of a small jury who are shown the enlargement itself. That it is in every respect a successful photograph will not suffice. At the exhibition to which we have alluded there were some marvellously good transparencies shown, printed by the Woodburytype process, perfect in every detail. But as lantern slides they were out of place altogether; counters laid out with curious shells and fossils and sponges followed one after another, and tried the temper of the audience sorely. The inside of a four-wheeled cab, with its vulgar plush-lining and damp straw, might be depicted in the same faithful manner; but what would be the good of looking at it? The weakest point about photographic slides is, that they grow monotonous after a while, and therefore, if you choose monotonous and uninteresting subjects, you court failure from the outset.

It is well, indeed, to bear in mind the advantages and disadvantages of lantern photographs. The old painted slide had colour to recommend it, and although photographs may sometimes be toned or even tinted with advantage, most of them are shown in black and white. The virtue of photographs lies in their graphic character and their truth, and in a lantern display, therefore, these virtues should be accentuated. To prevent monotony, avoid prosiness in describing your pictures, and, if possible, make a break in your display now and then by lighting up the room, if it is only for a few minutes, to relate an anecdote or to enter on some brief description. In a word, do not keep your audience looking at the screen for too long a time together.

One other point as to securing the interest of an audience: describe your picture *before* showing it rather than afterwards. Expectation is then on tip-toe, and your picture, when it appears, is already invested with interest, if not with romance. A mediocre photograph in these circumstances will attract a hundred-fold more than the best slide in the world, about which no interest is awakened. Let us give an example or two. We show a bare hill-side

covered with ruins, and after it has been before the audience some seconds, and become stale in their sight, we mention that it is the remains of a Roman town, and that an inscription on one pillar shows it to have been built by the third Augustan legion. Can anything be more uninteresting? Now let us suppose that the lecturer proceeds the other way about, and does his best to raise the expectation of the audience first. He will refer to history being half-fable, and speak of the Roman emperors and Roman conquests as hidden behind the veil of centuries. "Now," he says, "I will bring you face to face with these Romans. I will show you some proof of the mightiness of their legions, and how, hundreds of miles from home, they established Roman cities with magnificent public buildings, and elegant temples of carved stone, such as are the envy of our modern architects. Nay, I will show you more. I will show you the noble arch still standing of the palace where dwelt the governor, surrounded by his Pretorian guards, and an inscription upon its walls, 'Legio tertia Augusta,' telling us how it was the third Augustan legion that built this city, whose ruins speak far more plainly of the grandeur of the Roman empire than a dozen chapters of history." What if we now show our slide; surely the audience will feel more interest in it?

Of course, if you can narrate an interesting anecdote, all the better. Here is a picture showing a little crowd of people on a pier on the island of Patmos in the Mediterranean. It is an ordinary photograph enough, but let us invest it with a story. The picture represents a scene twenty years ago, before the Mediterranean had a telegraph cable, and the incident exemplifies very vividly how London is truly the centre of commerce and how its financial pulsations are felt all the world over. Those people on the pier on that little island in the Mediterranean are Greek merchants, and they are looking out to sea, some of them with telescopes even, anxiously scanning the horizon. They are watching for the first signs of smoke from a London steamer which is to bear to them news of the change in the bank rate that issues from the Bank of England parlour once a month.

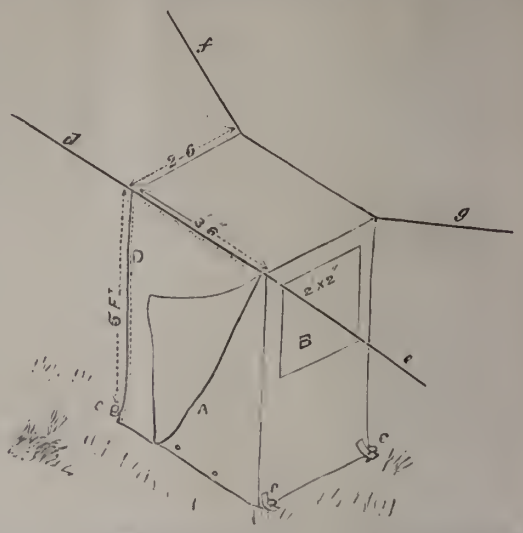
A TENT FOR CHANGING AND DEVELOPING DRY PLATES, ETC.

BY W. FRED. MAYES,
Assoc. M. Inst. C.E.

THE tent which I am about to describe is one I have had in use myself for some time, and for portability, ease of erection, and general usefulness, it leaves, in my opinion, little to be desired. It is a modification of one I saw in use for the wet process by the photographer of the Maharajah of Johore, when sojourning in the Malay Peninsula a few years ago.

Its form and dimensions are best seen by the annexed sketch. It is composed of one thickness of black satin—a very close material—lined with one thickness of best red Turkey twill, and one of yellow calico. The entrance, A, is rendered light-tight by an inner curtain of the same materials as the rest of the tent, running by means of rings along the cord, *d e*, which passes inside the tent, and made full enough, when drawn out, to leave one or two folds in the corner at D, where it is hooked to keep it in place when closed. At its lower edge are eyelet-holes to allow of its being pinned down by wire pins. The window is two feet square, and made by cutting away the outside material to this size, leaving the light to enter through the red and yellow linings and a sheet of orange paper, which, as a further protection, is suspended from a roller inside, the ends of which fit into loops on each side of the window. The paper is strengthened round the edges with tape, and at its lower edge is glued a thin strip of wood to keep it taut when down. When it is required to pack away the tent, the paper blind is rolled up and taken out.

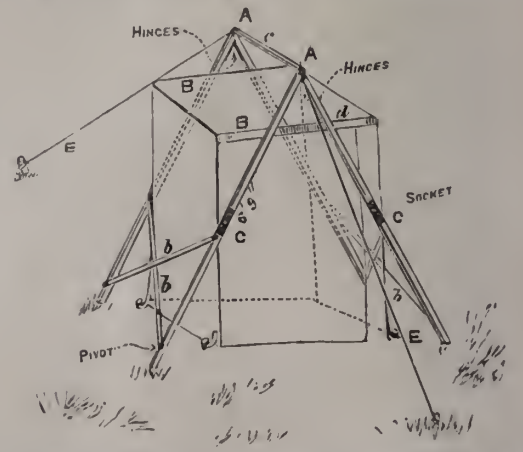
The cords by which the tent is suspended run through from front to back, the tent being, so to speak, slung on them. The curtain rings are threaded on one. The bottom edge of the tent is weighted with shot, and at the four corners are sewn strips of black canvas with eyelet-



A, curtain closing entrance; B, window; *c c c*, wire pins to hold tent down; *d e f g*, cords supporting tent.

holes, through which stout wire pins hold the whole firmly to the ground.

I use my tent indoors or out of doors. It can be suspended from hooks or nails in walls or from trees, or, two sticks being tied across the top from corner to corner, the whole can be suspended from a point overhead. It would, however, be necessary, if hanging from one point only, to steady it by fastening the cords from the four corners to pegs driven in the ground, or to weights, if indoors. I have also devised a stand, but have had no opportunity as yet of getting one made. As in many cases it might prove useful, I annex a sketch.



The stand is hinged at A A. At C C are metal sockets. The cross-ties *b b b* are of brass, pivoted at one end and hooked at the other. At B B laths passing through loops on the outside of the tent-hooks on the stand as shown in small sketch, and hold the tent in position. The cross-piece C fits on two iron pegs at A A, to which also are looped the cords E E, which support the stand laterally. (These are only necessary out of doors in a breeze).

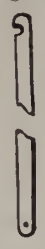
The whole of the stand should fold up into a space of about 3′ 5″ × 0′ 2″.

On the advantages of such a tent I need hardly enlarge. Its portability is, however, its chief point, for when rolled up and fastened with a couple of rug straps, it takes up no

more room than an ordinary overcoat, and can be carried as easily, though when erected it can take the place of an ordinary dark-room for indoor work, for which I generally use it when away from home. A small table and chair can be accommodated inside, if made of the dimensions given,

Hook at *d* to hold lath B.

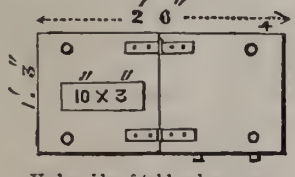
Pin for holding down tent.



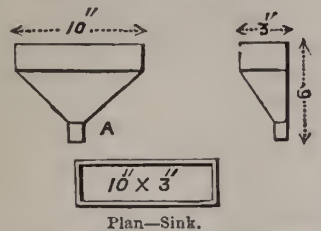
Cross tie *b*.

viz., 5 feet by 3′ 6″ by 2′ 6″. This, if it should not be convenient to carry its own table and fittings with it. As the table is likely to be a new feature in tent work, and the sink is altogether different to the one in common use, I append a short description of them. The rest of the fittings are such as may be found in ordinary use.

The table is 2′ 6″ long by 15″ wide, folding in the middle of its length, and forms, when closed, the top of the box carrying developer, dishes, &c. For this purpose, two pegs at the back fit into corresponding holes in the box, thus obviating hinges, whilst an ordinary lock in front renders it secure when in place. The legs screw in place about 4″ from each end, so as to relieve the hinges of as much weight as possible. The sink is of zinc 10″ by 3″ by 6″, having a rim on the upper edge, and is of the form shown in sketch. An india-rubber tube fits on the nozzle A; it is let in near the middle of the left half of the table, and being simply a slit 3″ wide, it deprives the table of



Under side of table when open.



Plan—Sink.

none of its usefulness when used for other purposes than developing. I have used one for years, and found it a great improvement on the old shallow form. When developing, the tray is placed over it, and when required to be emptied, it is simply drawn back a little and the contents tilted over. No splashing is possible with it. The chemical box forms a seat when turned up on end.

FRENCH CORRESPONDENCE.

Congress of Scientific Societies—The Submarine Soundings Commission—M. Audra's Emulsion and Coating of Plates.

Congress at the Sorbonne.—The usual réunion of all the French scientific and fine art societies was held in Easter week at the Sorbonne. There were no communications presented relating to photography, except two of my own—one, concerning my pocket apparatus, the model of which was completed by M. Français; and the other upon the progress of typography. With regard to the former, the great interest evinced showed that it supplied a great want. Geologists, naturalists, archæologists, physicians, chemists, &c., understand now how desirable it is to have a photographic *vade mecum*, and they appreciated the existence of a veritable pocket camera, the stand formed within an ordinary walking-stick. Of course it is also desirable that such an apparatus should cost as little as possible. For my own part, I affirm that it is always best to pay a good price for an accurate instrument capable of giving really excellent results, and scientific men and artists do not think it money wasted when expended on an instrument required to assist in research or careful observation of nature, and not treated as a child's plaything.

In the Fine Arts Section my paper on typography ought to meet with due appreciation, as the subject treated is not sufficiently familiar to our artists and even our printers. I explained how—thanks to the researches, and their results, of Pettit of Paris, Ives of Philadelphia, Meisenbach of Munich, and Goupil and Co. of Paris—wood engraving was surpassed. Even in those drawings of objects to be engraved the graver's work is useless, for nothing is easier, with the aid of paper and special drawing processes, than to obtain these designs transformed into typographic engravings by the intervention of a chemical engraving process, of a photographic reproduction transferred to copper or zinc coated with bitumen of Judea or bichromated albumen. Wood-engraving will cease to exist when these applications of photography to typography are recognised and are practised with as great a success as by our excellent and clever colleague, Mr. Bolas, in London. He may well say that, in general, great ignorance prevails of most of those processes capable of executing better and cheaper work than by the old methods, the chief merits of which lie in their being old.

Work of the Commission of Submarine Soundings.—The good work of the Commission of Submarine Soundings, presided over by M. Milne Edwards, Junr., was the subject of special mention and praise in the speech of the Minister of Public Instruction. It is a striking fact that, in making explorations at the bottom of the sea, observations relative to light have been entirely omitted. It would have been important to ascertain at what depth luminous rays, visible or invisible, cease to penetrate. It would have been interesting, also, to photograph the sea bottom at such depths as were accessible by special apparatus, and it is to be hoped that further explorations will be made in this direction. It is said to be astonishing what brilliant colours clothe beings living beyond all luminous action; it would be useful to know scientifically what is the submarine depth beyond which physical darkness exists. Moreover, one would like to see reproduced the effects of sea botton with its vegetation; and could it not be possible with the aid of electricity to illuminate these zones so as to observe and photograph at the same time? It would be of interest to obtain visible proofs of depths which, although inaccessible to any human being, would give as faithful a representation as if it resulted from direct observation. No doubt we have all dreamed about it. Meanwhile, I will endeavour to give a general idea as to the lines to be followed necessary for measuring the degree of actinism at various depths, so as to photograph the fauna and flora in their natural abode, which, hitherto, we have only seen in the isolated forms caught in the drag in sounding. With the aid of electricity and the sensitiveness of our apparatus, surely something ought to be effected in this direction without any other difficulty other than that of the immense pressure brought to bear upon the surface of the sensitive film. The main thing to be considered is to ascertain to what maximum depth apparatus capable of resisting the vertical pressure of the column of water can attain. It is altogether a question of calculating the pressure, and, to my mind, a solution must soon be found.

M. Audra's Demonstration of his Emulsion Process.—

M. Audra gave an experimental demonstration of his process in the preparation of gelatino-bromide emulsion, and the method by which the plates were coated, before the members of the Photographic Society of France. This demonstration attracted a large audience, who were delighted with the simplicity of the process and its excellent results, and the clearness with which it was explained It is of great use to many people desirous of knowing how to prepare a good emulsion to make it popular, as M. Audra is, undoubtedly, a great authority on the subject, as instanced by the number of years devoted by him to the study of so interesting a subject to the photographer. Leon Vidal.

Notes.

The Royal Academy has opened to the inspection of those privileged to take a private view, and to-morrow we shall have our newspapers filled with the usual long and tedious descriptions of art in 1884. We must say this much, however, of the present collection at the Burlington House: the pictures, taken all round, appear of a more robust school this year, and there is less of the nursery and the perambulator about them. Chubby babies and short-frocked little girls are very nice—especially on canvas—but we don't want every rising young painter to paint them. Visitors to the Academy lately have seen little else.

Nor is the Academy this year over-done by the namby-pamby school. Mr. Hodgson, R.A., asks us to admire in "Church Afloat" (484) a devout clergyman in a beautiful white surplice, standing in front of a body of open-mouthed sailors and marines, chanting the Psalms, two to a prayer-book; but there is little romance in the scene, for it could only happen in harbour. They do not have rows of thirty-twos on 'tween-decks at sea now-a-days, as Mr. Hodgson will find out if he enquires. Another ambitious picture equally open to the charge of false sentiment is "Mabel's Pensioners" (No. 804). This shows us a collection of decrepit old men who have come to receive the bounty of a priggish little miss of five or six, who presides at a table filled with loaves, and is assisted at her benevolent duties by a trim town maid-servant, who stands respectfully at attention. Can mawkish sentiment be carried further? We presume it was painted for the young lady's papa, who naturally wanted some return for the money that the loaves cost him.

Still, British painters can do one thing well, at any rate—they can paint the sea. We could give our French and German brethren long odds here, and beat them. Let the visitor look at the changing scenes of Mr. Henry Moore (577, 1626), of Mr. J. Brett, A.R.A. (1,574), of Mr. Colin Hunter, A.R.A. (389)—by the way, why is not Mr. H. Moore an Associate by this time?—of Mr. J. Faed (752), of Mr. W. J. Shaw (760), and other of our sea painters, and they will witness a school of art of which we may well feel proud. But of these pictures, as well as the Academy in general, we will speak next week.

The Photographic Society of Ireland announce an Exhibition of Photographs and Photographic Appliances in November next, in Dublin.

A diminutive weekly publication, called the *Nutshell*, has just appeared. It consists wholly and solely of reduced copies of newspaper or magazine articles and illustrations, the ordinary phototype or zinc etching process being doubtless employed for making the reductions. The production of a periodical entirely by photography in this way marks a new era in journalism.

Our readers will be glad to hear that Dr. Vogel has consented to make public the full details of his process for rendering collodion sensitive to various colours. In his communication to these columns three weeks ago, our colleague stated his ability to prepare a film that was many times more sensitive to the yellow than to the blue, and on that occasion he forwarded for our inspection a photograph of various colours, in which the yellow was represented by a light tint, and blue by a comparatively dark tint. This process Dr. Vogel now describes on our first column.

The Berlin Society for Advancement of Photography, over which Dr. Vogel has so ably presided for many years, has decided upon recognizing this act of Dr. Vogel's in a handsome manner. The worthy doctor is to receive a diploma of honour, together with a present of one thousand marks, in recognition of his discovery, which, as a matter of course, was laid before the members of the Society in the first place. We have reason to know that in the brief period that has elapsed since Dr. Vogel communicated the circumstance of his discovery to the press, he received several tempting offers to part with it, one firm alone offering the sum of two hundred pounds for the secret. Obviously, in the reproduction of paintings, a branch of photography that is now exceedingly important, this process of Dr. Vogel's will be of great value.

Those among us who believed the wet collodion process already dead and buried, will experience something of a shock in reading Dr. Vogel's practical details of his new method. Briefly put, he uses bromo-iodized collodion containing a solution of eosine, photographing through yellow glass to humour the yellow rays at the expense of the blue.

M. Gustave Hermite calls attention to a pretty experiment that may be worth trying in an idle half-hour. It is simply to take a landscape photograph on luminous paint in the camera instead of upon a dry plate. Two or three coatings of the luminous paint are applied to a glass plate or metal plate, and this is put into a dark slide and exposed thoroughly on a sunny landscape. The result, M. Hermite says, is very charming, the picture being capable of revival to a certain extent by warmth. By the way, what has become of M. Warnerke's and Captain Darwin's processes of enlarging by means of luminous paint?

M. Scamoni, the chief of the photographic branch of the State Paper Office of St. Petersburgh, will, in all probability, be entrusted with the reproductions of the Hebrew manuscripts of the Old Testament which Dr. Harkary is now

laboriously translating. Photography always renders a most valuable service in connection with antiquities of this description; it permits a hundred students in different countries to study the MS. at the same moment, and this, too, without risk of danger to the original.

On the occasion of the International Exhibition at Zurich last year, some interesting statistics were collected by M. Boissonas, concerning photography and photographers in Switzerland. It appears that last year there were as many as two hundred studios in the Helvetian republic, employing from five to six hundred assistants, and turning over three millions of francs annually. M. Boissonas divides these studios into three classes, and finds that in the first class there are 20 studios, employing from six to ten hands, 50 studios in the second class, with from three to six assistants, while the other studios, between 120 and 130, give employment to less than three persons.

No doubt photography has extended of late years elsewhere in much the same proportion as in Switzerland, and therefore the following facts are of general interest, viz.:—In 1860 there were 46 professional photographers, and few amateurs. In 1870 there were 101 professional photographers, and few amateurs. In 1883 there were 204 professional photographers, and many amateurs.

The combination of photography with the lantern is rapidly growing into favour with amateurs. A correspondent of a contemporary, in a letter on the magic lantern at home, says: "If I chance to get a day out, and have been lucky enough to secure, say, a dozen quarter-plate views, the first thing I do is to make lantern transparencies from them." Towards this end the tricycle will doubtless be made use of.

A propos of amateur photographers, and the ease with which they can now-a-days acquire practical knowledge and obtain practical results, a good many professional photographers are rather alarmed. The rush of amateurs will, they assert, still further encroach upon the narrow field which remains to professional photography. We are inclined to think such fears are groundless. Of course it is possible to take portraits at home, but to do them satisfactorily requires very different apparatus from that which the majority of amateurs employ. The best days of photography were when the amateurs dabbled largely in the art, and the re-wakening of interest in photography, though it may only amount to the taking of photographic "bits," ought to lead ultimately to the benefit of the professional man.

Vanity is the downfall of many a good man, aye, and woman too. A sailor absent from home for some time recently returned to his friends in Brittany, and accounted for his solitary absence by a Robinson Crusoe sort of story. He had been wrecked in the West Indies, and after living as an hermit for many months, was rescued and brought home. The man became a sort of hero, and all went well with him for some time, until, at an unluckly moment, he consented to sit for his portrait, and the pictures got circulated with the story. One of the portraits happened to come into the hands of an astute police officer, and it then turned out that the sailor was right, so far as he had described his life as one of enforced seclusion, but this had been passed in no more romantic locality than a Brest prison.

It will be remembered that Jean Luie, the wonderful witness in the Tichborne case, who gave himself out as the mate of the *Osprey*, came to grief in a similar manner. He also had a plausible account to give of his absence from England, and he, too, having blossomed into an hero, was foolish enough to permit himself to be photographed. The consequence will be recollected; his portrait was recognized by a prison warder as a convict recently in confinement, and Jean Luie was convicted of perjury.

The results of some curious experiments on the bleaching action of solar and electric rays have just been communicated to the Industrial Society of Mulhouse by MM. Depière and Clouet. It would seem that electric as well as solar rays bleach; that the bleaching takes place in air or in vacuum; that the yellow rays are the least active, and the red rays the most active; and that of all artificial lights the electric light has the most bleaching power.

Silver stains on linen or other fabric, most photographers know how to get rid of. Make a solution of iodine (by dissolving a few scales of iodine in iodide of potassium solution), and after rubbing the silver stains with it, immerse the fabric in hyposulphite of soda solution. But other stains are not so readily attacked. Iron stains and ink stains, for instance, are sometimes very obstinate, and an efficient means of removal is always welcome. The following advice is from the *Industrial Record*.

For ink stains, dilute hydrochloric acid, which must subsequently be carefully washed out, will generally be found effectual. For the same purpose oxalic acid or salts of sorrel may also be employed most economically by sprinkling it in fine powder over the stains, which are moistened with boiling water. The action of these solvents may be hastened by gentle rubbing, or, still better, by placing the stained portion of the fabric in contact with metallic tin. If there is much iron rust to be removed, dyer's tin salt (stannous chloride) will perform the work at less expense than the oxalic acid compound. Another solvent for such stains consists of a mixture of two parts argol with one part of powdered alum.

A novelty was introduced into the proceedings at one of Metropolitan Police Courts last week. A charge of cruelty to children was brought against two persons, the important point to be established being alleged starvation. After some evidence was taken the case was adjourned, the children being sent to the workhouse, where they were to be weighed and photographed, so that their present condition might be seen hereafter.

Patent Intelligence.

Applications for Provisional Protection.

6688. Samuel Dunseith McKellen, 18, Brown Street, Manchester, Watch Manufacturer and Jeweller, for "An improvement in cameras for photographic purposes."—Dated 23rd April, 1884.

6743. Norman Macbeth, Victoria Foundry, Bolton, Lancashire, Engineer, for "Improvements in the production of printing surfaces by the aid of photo-reliefs."—Dated 24th April, 1884.

6826. Peter James Charles, 26, Milk Street, Cheapside, London, Warehouseman, for "An improvement in photograph frames."—Dated, 25th April, 1884.

6898. Henry Joseph Redding, 53, Godolphin Road, Shepherd's Bush, London, W., Optician and Photographer, for "The 'Perfection' pocket ruby lantern."—Dated 28th April, 1884.

Specification Published during the Week.

4471. Richard Brown, and Robert William Barnes, and Joseph Bell, all of Liverpool, in the county of Lancaster, for an invention of "Improvements in means for and method of producing designs upon paper or other fibrous or soft material."—Dated 19th September, 1883.

We take a sheet of hard metal such as steel, and we cover the surface of this steel or other hard metal with a coating of what is known to photographers as sensitive bitumen, or with an equivalent composition. We then expose the so prepared steel or other hard metal to light under a photographic negative or positive picture upon which the required design has been obtained in the usual way. The result is that the design is reproduced on the sensitive surface, viz., it is printed by light in the sensitive surface, the action of the light having hardened the exposed portion, while that portion which has been covered or protected by the shades of the picture or design remain soluble. We then take the steel or other hard metal and develop the photograph thereon as usually practised, and wash away the soluble portions. We thus have the steel or other hard metal with the picture or design on its surface. After the picture or design is so developed, namely when the soluble portion has been washed away, we take the steel or other hard metal and etch the exposed parts by suitable acids or chemicals as usually practised in the art of photo etching. This operation causes the picture or design to be engraved, so to speak, on the steel or other hard metal. We then remove the bitumen or other medium from the sheet, and we have the picture or design in relief or in intaglio upon the steel or other hard metal. To produce pictures or designs from half-tone pictures or designs upon the steel or other hard metal, we prepare the negative or positive photograph in a manner such as patented to us on 15th March, 1883, No. 1380, namely, we give the photograph a grained, lined, or hatched surface, which is transmitted with the picture or design, and photo etched upon the steel or other metal. Having thus produced the picture or design upon the steel or other metal plate, either in relief or in intaglio, we pass the steel or other metal plate, in combination with such sheets of paper, leather, metal foil, or the like, as we wish to impress with the water mark effect, or embossed effect, as the case may be, through a pair of, preferably, hard steel rollers, and where large quantities of the subject have to be produced, the steel or other metal plate or sheet, having upon its surface the design, is affixed upon one of the rollers so that the paper, leather, metal foil, or the like may be passed rapidly through, either in single sheets, or from the web or roll. In lieu of applying the pressure by rollers, the pressure can be obtained by a screw or other press, but the process is slower.

Patents Granted in America.

296,913. Auguste Bissen, Paris, France. "Method of colouring photographs."—Filed Jan. 15, 1884. (No specimens.)

Claims.—1. The treatment of the translucent bodies for the reception of photographic impressions, consisting in subjecting them to the action of a bath composed of benzine, resin, and linseed-oil, in or about in the proportions herein specified, substantially as herein described.

2. The improvement in the art of printing photographs in colours, consisting in first obtaining stencil-plates or sheets cut out in the contours of the different colours, next applying said plates or sheets to lithographic stones coated with bichromate, then exposing the said stones and plates or sheets together to the action of the light and pressure under a glass, then removing the sheets and coating from the stones, and afterwards printing from said stones in flat tints, substantially as herein described.

297,017. J. Julius Sachs, Manchester, county of Lancaster, England. "Method of producing roller-surfaces for printing, stamping, or embossing."—Filed July 1, 1880. (No specimens.) Patented in England July 4, 1879, No. 2,724.

Claim.—In the preparation of metal rollers for printing, the improvement consisting in covering the roller with chrome-gelatine, placing around it a curved or flexible pattern adapted to transmit light to certain parts and prevent the transmission to others, exposing the roller to light, and revolving it to present each portion to the light, and removing the soluble portions of the chrome-gelatine coating, substantially as described.

PHOTOGRAPHY IN BRITISH BURMAH.

BY A. W. LONSDALE.

I have no doubt you and your numerous readers will be glad to hear from one who dabbles in the "Black Art," even in so remote a place as Tavoy. Before entering upon matters photographic, I must first of all briefly tell you something about Tavoy and its people. Perhaps some of you have never before heard of the place. It is a charming little town in British Burmah, situated about thirty-five miles from the mouth of the river known by the same name. Large ships and steamers are not able to come up to town, as the river is only navigable to vessels of small draught. The steamer from Rangoon anchors about half-way up the river, and the mails and passengers are brought up by a steam launch. Tavoy has been in the hands of the British for upwards of half a century, during which time it has made rapid strides in civilization. It was founded in 1751, though the country is noticed much earlier. In 1752, the ruler of the country made overtures to the British to establish a factory in or near his capital. During the first Burmese war, the garrison rose against the commander on the appearance of the British at the mouth of the river, and handed the place over to the English, together with the person of the second in command, and his family, whom they had taken prisoners. According to one tradition, the name of this town is a corruption of a Siamese word meaning a "landing-place for rattans," and according to another it was so named because it was celebrated for its armourers, people coming from a long distance to buy swords (*dha* a sword, and *wai* to buy). Which of these two traditions is reliable it is difficult to say. The town is laid out in straight streets, and the houses are for the most part built of timber or bamboos, and thatched with *dhavee* leaves. To the East and West are ranges of hills running nearly North and South. The surrounding land is under rice cultivation, and during the season is rendered swampy by the small embankments raised to retain the raised water on the fields. It contains court-houses, police-stations, a custom-house, post-office, hospital and dispensary, market, a middle school, and a gaol, besides numerous pagodas, monasteries, and zayats or rest-houses. The inhabitants are mostly Burmese, there being only a handful of Europeans and natives of India. The "Heathen Chinee" and the Israelite are also to be met with here. The European residents are principally those in Government employ. There are a few others who are merchants and coffee-planters. The Burmese are, as a rule, an indolent and vain race, very fond of amusements, and so happy-go-lucky are they that some one has deemed it fit to term them "the Irishmen of the East." Photography is greatly appreciated by them, as nothing pleases them better than to admire self, and photography enables them to do that.

Being only an amateur, my practice of the art is confined to leisure hours, and I am, therefore, entirely a "dry plate man."

My outfit consists of a beautifully-made 10 by 8 camera and double dark slides, by Messrs. Wratten and Wainwright, Ross' symmetrical lens, and a portrait combination. I have a "glass-house," which, however, has not a bit of glass in it. It may seem a novel affair to some, but it answers my pur-

pose admirably. I have an opening on one side of the ridge roof, which has a frame-work hinged on to the ridge of the roof, and covered with roofing material. This frame is lifted when the studio is to be used, and it gives me a splendid top light. Screens and curtains are freely made use of. Of course this sort of studio, however well it may suit an amateur like myself, who takes portraits for mere amusement, will not do for a professional, as he will be debarred from working on wet days. Talking about the studio reminds me of an amusing incident which took place in it the other day. A couple of Burmans came in, one of them desiring to be photographed. Having got everything ready, I began to focus the sitter while his friend walked about the studio. His eye caught a glimpse of the picture on the ground-glass, and, being emboldened by a smile from me, he came closer to examine it. You should have seen him! He stared at the picture, and, with a look of astonishment and disgust, he exclaimed, addressing his companion the sitter, "I say, this is not good; look out, you'll come out upside down." You may depend upon it, I turned the Tavoyan philosopher out of the room. After a deal of trouble in explaining and getting the man to sit quietly, I managed to secure a picture. On showing it to him the right side up, he opened his mouth wide, and said in his tongue, "Tay koung-dai!" ("Very good!")

Now a few words with regard to developers. The ferrous oxalate is in great favour with me here. The alkaline developer, strange to say, does not at all answer in this climate. I have tried Mr. Newton's carbonate of soda developer. I don't approve of it, as it tends to frilling. The plates, which had never frilled before, did so under its influence. I have adopted M. Audra's method of preserving the iron solution. It is a first-rate idea, and every photographer using the iron developer who has as yet not tried this, should do so without delay. Tavoy abounds in beautiful sceneries. I hope to take a photographic tour round the country some day.

Before concluding, I must make it a point to say that your valuable News finds its way here to me. It is my photographic companion and guide.

Goot School House, Tavoy, B.B., 10th March, 1884.

ON LENSES.

BY W. E. DEBENHAM.*

When, in January 1839, Daguerre in France, and Fox Talbot in England, announced that they had succeeded in fixing the image of the camera, that instrument at once acquired an importance that could not otherwise have belonged to it. The lens with which it was furnished, although considered sufficient for a toy, or for occasional use to assist a draughtsman, had several characteristics which made its work as an instrument for the photographer very inferior to what a scientifically-designed instrument would give. Taking an ordinary double convex lens (say) of two inches diameter, and twelve inches focus, the following four faults had to be corrected:—1. Difference of the chemical and visual foci, necessitating an alteration or adjustment of the position of the plate, varying in amount with the distance of the object to be photographed, after each focussing. 2. Spherical aberration, in consequence of which the image was more or less confused, and wanting in sharpness everywhere. 3. Curvature of the field, in consequence of which objects at equal distances, but upon different portions of the field, would be out of focus unless the plate were cup-shaped instead of flat. 4. Slowness of action.

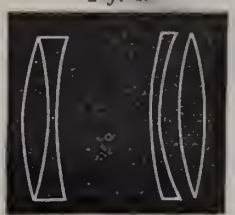
The difference of chemical and visual foci could be corrected upon the lines already laid down. Daguerre himself, indeed, used an achromatised lens, but in England some of the earliest cameras were made for uncorrected lenses, and had graduations marked upon them for adjustment after focussing. The second mentioned fault—spherical aberration—was the most important, and the discovery of the remedy for this involved the cure of the fourth defect, or that of slowness of action; because spherical aberration increases with the aperture of the lens—that is, with the proportion of the size of the lens to its focal length—so that a lens which was scarcely tolerable in its definition could not afford to have its rapidity increased by making it of larger aperture.

The want of a suitable lens being perceived, opticians and mathematicians in several countries set to work to try and cure the evils above-mentioned. One of these—Professor J. Petzval, of Vienna—succeeded in calculating the formula for an instrument which has always, and justly, been considered a triumph of mathematical science. So complete did it come into the world, that in more than forty years it is questionable whether any very important improvement or modification has been made upon it. This Petzval lens is the well-known portrait combination, which, with some differences of detail amongst themselves, has been made by photographic opticians in all parts of the world. The essential and most striking characteristic of this lens is the elimination of spherical aberration, and the means by which this is achieved is particularly, the separation of the components of the back combination. This separation allows the flint negative lens to possess so much negative spherical aberration as to correct the positive aberration of the whole system; and so perfectly is this accomplished, that it was possible to have the lens much larger in proportion to its focal length—quicker acting, that is—and, at the same time, give far finer definition than could be obtained with the then existing lenses, unless a very small stop had been used. The focus, at the same time, was somewhat lengthened towards the margins, so that the field although not flat, was yet of a flatter curve, and did not for some distance on each side of the axis depart far from the flat plate.

By tolerating a certain amount of astigmatism it is possible to make the field of the lens flatter, and the amount of sacrifice that should be made of possible marginal definition to flatness of field, is a question upon which opticians have differed. I have said "possible marginal definition," meaning the definition that can be obtained towards the margin of the field if that part only be focussed; but in doing this with a lens of round field the centre of the picture must be thrown much out of focus, or the subject to be photographed must be arranged in a deep curve. When this is done, owing to the violence of the perspective, all but the middle of the picture will appear exaggerated in size; and this effect is to be condemned, whether in the side figures of a group, or, as it has sometimes been put forward in favour of a lens of round field, the advancing knees and hands of a sitting figure.

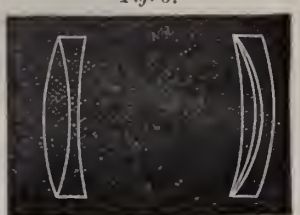
In some French portrait lenses of recent make, considerable flatness of field has been attained. The absolute definition has had to be a little sacrificed, but I think this sacrifice well worth making.

Fig. 4.



Portrait Lens—Petzval's Orignal.

Fig. 5.



Portrait Lens—Dallmeyer's Modification.

In the year 1866, the late Mr. J. H. Dallmeyer patented a variation of the Petzval lens. This variation consisted in reversing the elements of the back combination with such a modification of the curves as this change involves. The particular advantage claimed at the time for this form of lens has since been abandoned. The putting of the negative lens at the back allowed its distance from the positive element to be varied, and thus the perfection of its correction for spherical aberration to be modified. It was stated that by altering the distance of the back lens, so as to re-introduce spherical aberration, and sacrifice definition at the focus, improved definition was obtained upon the planes not in focus. This claim—"diffusion of focus" it was called—was shown to be mistaken, and is no longer made. The lens, however, when employed with the elements in the position of best definition, is a useful one, and some other well-known opticians have for some time past issued a series of lenses of this form. In this case, however, the back lenses are burnished together into their cell, and no shifting or alteration of their position is possible.

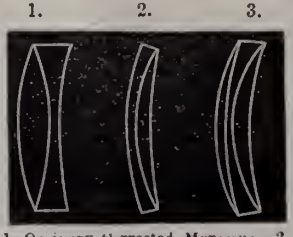
While on the subject of "diffusion" or "depth" of focus, it may be remarked that a delusion on this point is cherished by a vast number of photographers. For this the manufacturing opticians are somewhat to blame. They have been in the habit

* Continued from page 263.

of advertising lenses as having great "depth of focus," whereas that is a quality that, except as attained by the use of a small aperture or diaphragm involving slowness of action, does not exist at all. Still many photographers—careful, practical men, too, some of them—will tell you that they have, or have had, some particular portrait lens that will give the various parts of a sitter's head, the background behind him, and generally objects on different planes, with sharper definition than other lenses of similar aperture and focus, that have as fine, or finer definition on any one plane. This is a curious case of mistaken observation; but in photography, unfortunately, mistaken observations may pass current as scientific facts.

Before passing on to the consideration of other lenses, it may be observed that some discussion has taken place as to what is entitled to be called a portrait lens. It is probable that portraits have, at some time or other, been taken by all the kinds of photographic lenses in existence. I have myself had in regular use a single lens for panel portraits, and a lens of the rapid doublet, or Steinheil type, for promenades; but as the name "portrait lens" has been accepted as the distinguishing title for the Petzval instrument first described, and as the most striking characteristic of that instrument is, that it will give good definition when used with an aperture of one-fourth of its focal length, or even more, it would, perhaps, be best to retain the name portrait lens for a lens constructed on such principles that it may be made to work with that aperture.

Of single lenses there are three distinctly-marked varieties. The first is the ordinary corrected meniscus. This is the well-known single landscape lens. The two faults in it are, that a small diaphragm is necessary in order to correct its spherical aberration, and give good definition, and that it gives distortion. To correct to a certain extent the first of these evils, Mr. T. Grubb, in 1857, introduced what he called his aplanatic lens. It is not aplanatic, but the method of correction he employed—placing the negative lens at the convex side—mitigated spherical aberration to such an extent that he thought it entitled to be called "aplanatic" in comparison with the ordinary single lens. It may, therefore, be worked with a larger opening. The panel portraits now shown were, with one exception, taken with this instrument.



Single Lenses.—1. Ordinary Corrected Meniscus.—2. Grubb's "Aplanatic."—3. Dallmeyer's Single Lens.

Dallmeyer's single lens consisted, like some of Dollond's telescope objectives, of a negative lens between two positive ones; but the curves are, of course, quite different, being calculated for marginal definition and flatness of field.

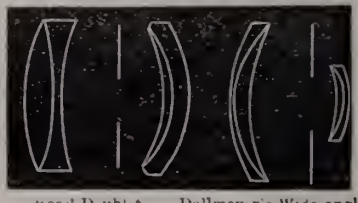
The so called "orthoscopic lens,' introduced in 1857, was constructed from calculations made by Petzval at the same time that he was engaged upon the portrait lens. The front part is identical with that of the portrait lens; but the back consists of a dispersing lens, so that the whole instrument is longer in focus than the front part alone. It was a curious misnomer to call it "orthoscopic," seeing that it necessarily gives distortion, although

Petzval's Orthoscope.

from the diaphragm being at the back, this distortion is in the contrary direction from that given by the single lens. There were some good points about the instrument, and it is quite possible that if it had been introduced since the advent of the rapid gelatino-bromide process, it would have found more favour, especially for large portraits, than it has done. I should not be at all surprised to see it, or something modelled upon it, come into use. Sufficient care was not always taken to make the correction for actinic rays perfect. In one that I possessed, it was necessary to shift the camera back nearly half-an-inch, but when this was done, a very good portrait might, in a quick light, be taken even with collodion.

Triplet lenses were introduced in two ways; one was as an instrument for obtaining architectural views without distortion, and another was an adaptation, to the portrait lens, of a concave glass in the place of the diaphragm, for the purpose of lengthening the focus and flattening the field. Slater, in 1858, I think, made instruments of this kind for sale. As an occasional expedient a similar device had long previously been employed. Derogy made many of such instruments, one of which is on the table. Triplets have now been generally superseded by doublets.

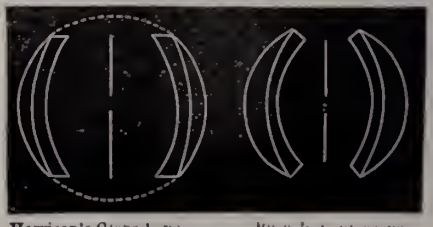
To obviate the distortion caused by the single lens many double combinations have been devised. In these, the diaphragm being placed between the lenses, the distortion caused by one lens is counteracted by distortion in the contrary direction produced by the other lens. The first of these to come into any general use was the globe lens of Harrison, brought out in 1860. This supplied such a much-felt want—that of a lens of wide angle without distortion—that it was much used; but the exact globe form was found to favour the formation of a patch of reflected light in the picture called a "flare" spot. Some five years later Ross introduced a lens which achieved great popularity, and was really so useful an instrument that it deserves some special mention. The front lens was a meniscus corrected in the usual manner, but the back lens had, like the Grubb single lens, the negative lens outwards. A description of a doublet with a back lens of this character, made by A. Ross, was published as long ago as 1846. The instrument had a wide angle of light; but this could be made even wider by setting the lenses a little closer together, as has been done in the case of the instrument now shown, and this, so far as I have been able to ascertain, without in any way injuring its definition. The great angle of light admitted, permits of the lens being used even for tall buildings by raising the camera front without tilting the back, and I think it is to be regretted that it is no longer manufactured. They appear



Ross' Doublet. Dallmeyer's Wide-angle Rectilinear.

to be well appreciated, as I notice that when any are in the hands of the dealers they are marked at good prices. Dallmeyer's wide-angle rectilinear is a doublet which, constructed on different principles, works very similarly.

Busch's pantoscope is a lens partaking of some of the characteristics of the three last mentioned lenses. It has a very wide angle



Harrison's Globe Lens. Busch's Pantoscope.

and is a very useful instrument. It differs from the globe lens in that the exterior surfaces do not form part of one sphere. I have not found "flare" when using it. A lens that I have not had the opportunity of examining is a doublet by Morrison, of New York. An excellent judge, however, Mr. Traill Taylor, gives a favourable account of it. The striking peculiarity of this instrument is that one of the elements, the backone, is single, all the correction being performed by a flint in the front combination. Some eighteen or twenty years since I constructed an experimental lens, the front of which was a single meniscus, and the back was an objective out of an opera-glass, altered by having the concave side ground deeper. This lens gave an enormously wide field, but required the use of a very small diaphragm.

Before proceeding to the consideration of the more modern

doublets, it is worth while to notice two which I believe have one out of manufacture. These are the periskop of Steinheil and the Zentmayer lens. Their particular interest consists in the fact that, being constructed of uncorrected crown lenses only, something similar to them can easily be improvised. Steinheil's

Steinheil's Periscope.

periskop consisted of two similar meniscus crown lenses placed near with a small diaphragm between them. After focussing, the camera back had to be brought nearer to the lens by $\frac{1}{40}$ of the focal distance. The field was very flat, and the angle included large. Zentmayer's lens was constructed on similar principles, but was furnished with two diaphragms, the larger of which was to be used for "convenience of light" in focussing, and the smaller one for the exposure. It was introduced as a lens not requiring correction, although made of one medium crown glass only; but this paradox was only apparent, not real.

On looking at the diagram of spherical aberration (fig. 2), it will be seen that the general approximate focus of a lens with large aperture is shorter than the focus of the same instrument when used with a small diaphragm. Zentmayer's lens had great spherical aberration, and it was, therefore, only necessary to make the focussing and exposure diaphragms of such sizes, as to alter the focus in the same proportion as the chemical focus was shorter than the optical one. I have here a lens that I had constructed some years previous to the Zentmayer being brought out, when I was desirous of photographing subjects occupying a wider angle than I could do with the lenses then to be purchased. The radii are about as six for the convex and seven for the concave surfaces, and the distance of the lenses apart as four. If the lenses are of large diameter in proportion to the focus, an enormous angle of view can be obtained.

This is the lens which within the last week your Secretary, Mr. J. J. Briginshaw, has had for the purpose of photographing a tall building in the city which he could not with an ordinary lens do, on account of there not being space to retire with the camera. He had brought the negative with him, and you will be able to judge of the occasional usefulness of such an instrument. The camera was used level, and the front much raised. From the point opposite to the lens five inches can be measured to the corner of the plate. This gives a circle of ten inches. The focus of the lens is about three and a-half inches. The back was not altered after focussing, the correction, as with Zentmayer's lens, being made by the insertion of the diaphragm.

(To be continued.)

A Dictionary of Photography.

ALDEHYDE.—Ordinary, or acetic-aldehyde, is a typical example of the aldehyde series. It forms a volatile liquid, which corresponds to the formula C_2H_4O, differing from ordinary alcohol (C_2H_6O) by containing two atoms of hydrogen less. Hence its name. Aldehyde is generally formed by the partial oxidation of alcohol, as, for example, when it is exposed to the action of spongy platinum and air, nitric acid, or chromic acid. Aldehyde is almost always present in an old nitrate bath which has been used for wet collodion work, and some commercial samples of acetic acid contain traces of it.

As aldehyde is a very powerful reducing or deoxidising agent, its accidental presence in photographic solutions may do much mischief, causing stains of reduced silver. Its odour is very characteristic, and resembles that of *sweet spirits of nitre*, of which liquid it forms a considerable proportion. Boiling, or exposure in an open dish to the heat and light of the sun, will serve to remove aldehyde from the bath, and when it is present in acetic acid, the best plan is to reject the sample, as unless the acid be neutralized with an alkali, aldehyde in acetic acid cannot be easily detected by its odour.

As aldehyde is an energetic reducer of silver salts, it may receive important applications in photography. It has been used for improving the tone of collodion transparencies, it being possible that it acts by completing the reduction of the silver. Acetic acid is formed by the oxidation of aldehyde.

ALKALIES.—Basic substances which are freely soluble in water are commonly called alkalies, as these bodies possess in a high degree the properties called alkaline. The important alkalies are potash, soda, and ammonia, while such as lithia are of little interest excepting from a scientific point of view. Some notion as to the chemical interrelation of alkalies, acids, and salts, may be gathered from a study of our article on "Acids, Bases, and Salts" (p. 460 vol. xxvii), but we may mention here that red litmus paper is a rough and ready test for alkalinity, alkaline substances changing the red colour to blue, while acid substances change the colour of blue litmus paper to red.

ALKALINE DEVELOPMENT.—*See* **Development.**

ALLOTROPISM (*ἄλλος*, another; *τρόπος*, a fashion) —It not unfrequently happens that one and the same body may exist in several distinct forms, and the rarer or unusual forms are said to be allotropic modifications of the substance. Thus carbon, which is ordinarily met with as charcoal or coke, exists in the allotropic forms of graphite and diamond. Light and heat often cause bodies to assume allotropic conditions.

ALTERNATIVE ACTION OF LIGHT.—*See* **Reversed Action of Light.**

ALUM.—The term alum is applied to a class of double salts which are analogous in chemical structure with common alum. Ordinary alum is a double sulphate of aluminium and potassium which contains $Al_2(SO_4)_3,K_2SO_4+24H_2O$, and which has been known from very ancient times. It has a specific gravity of 1·726, and is soluble in about eighteen times its weight of cold water, and in less than its own weight to hot water. It re-acts like an acid on litmus paper, and its solution slowly dissolves iron or zinc, hydrogen being evolved. If heated to about 200° C., its water of crystallization is driven off, and a spongy mass known as burnt alum remains. The so-called "patent alum" is a crude sulphate of aluminium; and ammonium alum (common alum in which ammonium takes the place of potassium) is often sold in the shops as ordinary alum. The property of alum which is of most interest to the photographer is its power of hardening gelatine and rendering it more or less insoluble, and alum consequently finds applications in many photo-mechanical processes and in gelatino-bromide work.

The subjoined table gives the composition of a few of the alums, the common or potassium alum taking the first place as the prototype:—

Potassium alum ...	$K_2Al_24SO_4.24OH_2$ or $Al_2(SO_4)_3,K_2SO_4+24H_2O$
Sodium alum ...	$Na_2Al_24SO_4.24OH_2$
Ammonium alum...	$(NH_4)_2Al_24SO_4.24OH_2$
Iron alum... ...	$...K_2Fe_24SO_4.24OH_2$
Chromium alum ...	$...K_2Cr_24SO_4.24OH_2$
Manganese alum...	$K_2Mn_24SO_4.24OH_2$

The only rarer alum which need be mentioned is chrome alum, a salt now made on a considerable scale for use by the dyer and calico printer. Its action in making gelatine insoluble is far more energetic than that of ordinary alum, and as a smaller quantity suffices, is often to be preferred. It must, however, be remembered, that chrome alum communicates a faint greenish colour to gelatine, while ordinary alum does not tint it.

AMBER.—A fossil substance, which has many of the characters of a resin, but sulphur appears to be an essential constituent of it. It is a light yellow transparent substance, of a slightly greater density than water. It has the property of becoming very electrical by friction. Amber consists of a mixture of several resinous bodies. It has been used in photography for the purpose of preparing a varnish for negatives.

Amber varnish is prepared by putting one part of finely-powdered amber, and one part of clean-washed sand, into a bottle with eight parts of chloroform; allow it to stand for some days, shaking occasionally; strain through muslin, and squeeze the liquid from the interstices of the spongy residue of the amber and the sand; then filter through bibulous paper. The best place to procure good amber is at large tobacconists, or meerschaum importers; broken mouthpieces of pipes and scraps may be procured there of any desired purity, and at a low rate.

AMBROTYPE.—A name given in America to positives on glass, or other transparent medium, in which the whites are composed of the metallic deposit, and the dark parts are obtained by placing black varnish, or other black substance, behind the picture.

Correspondence.

PRINTING PROCESS FOR INDIA.

Sir,—"Assam" may find argentic gelatino-bromide suit him. I tried the paper (imported from England) successfully in India, but did not like the tone of the prints. I believe this objection has been overcome. Biela.

PS.—The paper must be kept in a perfectly air-tight case.

EDER'S POTASH DEVELOPER.

Sir,—I have lately been trying Eder's pyro potash developer. It certainly takes longer than the ordinary pyrogallol developer; and though all the details come out, does it not require a longer exposure for the plate? Although in all cases I used about 60 minims of each solution to the 3 ounces, and then added more pyrogallol, still there was a want of the contrast and brilliancy I obtained with the usual developer.

If once the details are all out, what proportion of the pyro solution can one add without harm in order to secure density and contrast?—Yours obediently, A. G. B.

THE PROPOSED AMALGAMATION OF THE LONDON PHOTOGRAPHIC ASSOCIATIONS.

Sir,—I trust it will not be considered unseemly to reopen this question. A certain section of the photographic community is smarting beneath a sad bereavement, and are now left, so to speak, like sheep without a shepherd. I apprehend the present is an opportune moment for again referring to the subject.

It is now more than twelve months, if I mistake not, since Captain Abney first set this ball "a-rolling," but if it received a kick at all, it must have been the reverse way, for nothing of a practical nature seems to have come of it. Very few, I imagine, could be found amongst photographers who are prepared to argue against the desirability of a greater concentration of forces than now exists, for it must be admitted that at present there is a great loss of power, owing to defective organization. A proof in favour of this idea may be found in the fact that a great many of the leading photographers in this, the leading city of the world, either hold themselves entirely aloof from the societies, or, what is even worse, pay the regulation fees, and take no further interest in the matter. I am convinced that a vastly improved condition of affairs would soon be brought about if photographers, either individually, or in their collective capacity in connection with the different societies which already exist, would only band themselves together with the idea of obtaining a house of their own, which should be worthy of the associated societies, rather than be at the mercy of the proprietor of this or that hotel, wherever it may have pleased improvidence to lead them. I am not in the least degree in favour of discarding the social element from our midst, for, like the cement used in the construction of a building, it is that which keeps societies together; but I fail to see why the money which is now expended in that direction should not be employed to a much greater extent, than now, in contributing to our mental edification and social enjoyment. There are many points of detail which would have to be discussed before anything like decided action could be taken in amalgamating the London associations. —I remain, yours, &c., William Cobb.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 24th ult., Mr. A. Cowan in the chair.

Mr. A. Mackie enquired whether, by separating the components of a lens to improve definition, the achromatism would be affected?

Mr. W. E. Debenham said it would, to some extent.

Mr. Haddon mentioned that telescopes giving imperfect definition are sometimes much improved by separating the lenses.

Mr. J. Barker desired to know what would be the effect of increasing or decreasing the distance between the front and back lenses in any combination?

Mr. Debenham replied that the focus would be altered.

Mr. Haddon enquired whether it was possible to permanently deform a lens by keeping it tightly screwed up for some time? A friend who returned a faulty lens to the maker was informed that the lens had been spoilt in the way mentioned.

Mr. W. K. Burton said glass was too elastic to admit of this supposition. Referring to French lenses mentioned by Mr. Barker, he said it very often happened that the lenses forming the back combination were only adjusted approximately, which might or might not give the best result; many of these lenses could be vastly improved by separating them 1-16th of an inch.

The Chairman passed round a series of negatives taken with four of the eighteen combinations of Darlot's set; also a series of the same subjects taken with English lenses of similar focus and aperture. The Darlot series were not inferior to the others, whereas the same number of combinations from English lenses were very costly. Perhaps Mr. Burton would work out a table for the Darlot combinations, permitting the various foci in millimetres being compared with the universal system in inches.

Mr. Burton had just compiled a table which would answer the purpose, the diameters being in vertical lines, and the focal lengths in horizontal. It would be published in a few days.

The Chairman exhibited a book made to hold twelve plates (page 270); when closed in the two outer cases, it was under two inches in thickness. The following question from the box was then discussed:—"Will an emulsion giving 20 on the sensitometer, when mixed with another emulsion less sensitive, give a mean between the two?"

The Chairman had mixed an ammonia emulsion giving 19 on the sensitometer, with a boiled emulsion registering 8 or 9, and failed to get a mean result. The slow particles in the latter would not be acted on by light. Mixing emulsions varying only one or two degrees would not make much difference in speed.

Mr. Burton knew one commercial plate maker whose practice was to add a boiled and ammonia emulsion together to get quality and speed combined.

Mr. A. L. Henderson saw no advantage in the mixture except to prevent halation; harmony of tone could not be obtained in that way.

Mr. Moule showed an old form of bijou field camera holding fifty $1\frac{1}{4}$-inch plates, the drum in which the grooves were arranged being attached to an opera glass.

Mr. W. M. Ashman passed round several pieces of Messrs. Law and Son's new golden fabric together with green oil silk as recommended by Mr. Debenham. He exposed a plate giving 22 on the sensitometer one minute to the gaslight from a large fishtail burner passed through three thicknesses of the fabric and two of oil silk, the distance being two feet; there was no trace of fog. Four thicknesses of fabric alone gave more illumination and no fog.

Mr. Mackie had developed a rapid plate for ten minutes two feet from the light emitted from a candle covered with one thickness of the golden fabric; the illumination was excellent and the shadows were not fogged.

Mr. F. M. Hart developed plates 24 on the sensitometer with two thicknesses of orange paper illuminated by a candle, and there was no fog; he saw no advantage in any of the recent recommendations over the common orange paper.

Mr. W. H. Prestwich spoke in favour of red cherry fabric. If diffused, not direct, light were used, plates might be exposed an hour to its influence without harm, there being enough light in his own room to read in any part of it.

Mr. J. Stewart (Helensborough) used the orange paper two ply in his coating-room. The lamp was fixed in the ceiling similar to the lamps in railway carriages; the light passed through orange paper on to a white ceiling, and thus illuminated the room.

A discussion then ensued on the sensitiveness of a bromoiodide collodion film after development, opinions varying widely.

Mr. Henderson said that about 1857 he sent some transparencies to the Editor of the Photographic News, which were taken direct in the camera. In reply to queries, he said

they were partly developed, then exposed to white light (it was no consequence whether the films were washed or not), they were flooded with iodine in iodide of potasium, redeveloped with acid pyro and silver, and cleared with cyanide.

The Chairman said the members would be grieved to hear the loss photographers had sustained in the death of the President of the South London Photographic Society, the Rev. F. F. Statham.

Upon the motion of Mr. W. M. Ayres, seconded by Mr. A. L. Henderson, it was resolved to forward a letter of condolence to the family.

Liverpool Amateur Photographic Association.

The ordinary meeting of this Society was held at the Free Library, on Thursday, the 24th ultimo, Dr. Kenyon, President, in the chair.

The minutes of the March meeting were read and confirmed, and Mr. C. Hairis was elected a member.

The Chairman announced the donation of two lantern slides for the library, and eight prints of views near Settle for the album, from Mr. Watts. He (the Chairman) stated that with reference to a passage in his introductory address suggestiug the desirability of a dark slide made with the shutter to open inside the camera—in place of the usual drawn-out shutter, which was too familiar in commerce—he had received a letter from Mr. S. Sidey, of London, stating that he had constructed two such slides about three years ago, never having seen or heard of one before; he had used them ever since, and offered to send one for the Society to examine. The Chairman gladly accepted the offer, and had the pleasure of exhibiting the slide. The mechanism, it would be observed, was beautifully simple aud most ingenious. A slide of this kind would be most useful in instantaneous work, and wherever it was desirable to have the camera as inconspicuous as possible. The shutter exhibited was lighter and more compact than the ordinary form. Its use presented less leverage to the wind and less chance of admission of light during exposure. The plate was uncovered far more easily than by drawing a shutter. A rigid camera might be carried ready focussed, and with slide exposure readily effected without anyone knowing what was going on. He (the Chairman) proposed a cordial vote of thanks to Mr. Sidey for his kindness in sending this interesting exhibit.

Mr. J. Thomson exhibited and explained a new stand of his invention. The main features of this new staud consisted of stays for the purpose of steadying a large camera, and a very ingenious compass-swing arrangement for instantaneous work at sea, enabling pictures to be taken when the rolling and pitching of the vessel would otherwise render photography impossible.

Mr. H. N. Atkins recounted his last bank-holiday experience, when he found an excellent substitute for a focussiug-glass in a film of gelatine which had had some milk added to it before it had set.

The Rev. H. J. Palmer corroborated Mr. Atkins' experience, and said that five ago he had read a paper in that room recommending the gelatine-milk film as a substitute for ground glass.

Mr. Cornish exhibited a stand, each leg of which is composed of a ribbon of steel, which is rolled and extended on the principle of a paper spill-lighter. Indeed, each leg is one of the "portable walking sticks" such as may be purchased at the bazaars in Paris. In answer to numerous questions, Mr. Cornish stated that it took from five to ten minutes to put up.

The Chairman showed and described a new camera by Hare, which contained several novel features, and had been made especially for the tricycle.

Mr. J. H. Ellerbeck opened the discussion upon the subject appointed for the evening, namely, "The Best Mode of Developing Instantaneous Negatives." He thought that among the essentials for success in this department of photography were slow development and the use of less pyro than usual.

Mr. R. Crowe said that there were three classes of instantaneous subjects:—1. Open sea pictures with but little contrast. 2. Street views. 3. Lake scenes, and subjects with deep shadows. His formula for instantaneous work was one ounce of ammonia to two ounces of water, with sixty grains of bromide of potassium. For pictures in class 1 he would use a double quantity of pyro and double bromide, in order to increase the contrasts. For class 2 three grains of pyro to the ounce, and the usual proportion of bromide. For class 3 less pyro than usual, care being taken not to force development and so produce fog.

The Chairman asked Mr. Crowe the lens and aperture with which he usually worked.

Mr. Crowe replied that he used a Steinheil lens of eight and a-half inches focus, and an aperture of $\frac{f}{8}$.

Mr. W. H. Kirkby asked for further detail as to development.

Mr. Crowe said that the plate should be placed in pyro. solution first, and then the ammonia and bromide added, twenty drops at once, and as soon as discolouration took place developing should be stopped.

Mr. Ellerbeck recommended keeping bromide and ammonia solution in separate bottles. By using bromide and pyro. first, and then adding ammonia, there would be greater likelihood of clean pictures.

Mr. Kirkby preferred to begin developing with plain pyro., and then to add ammonium and bromide.

The Rev. H. J. Palmer invariably gave a preliminary soaking in very weak solution of bromide of potassium.

Mr. Watts, on the other hand, strongly advocated first soaking in water with a few drops of ammonium, and then adding pyro. and bromide.

The Hon. Secretary suggested that as the discussion was an important one, it should be deferred to the May meeting, and be opened by Mr. Watts.

Mr. Ellerbeck showed some prints from negatives recently taken at Hawarden.

The Rev. H. J. Palmer produced an excellent developing lamp made from a Chinese lantern, and rendered non-actinic by ruby varnish.

After the usual votes of thanks to the exhibitors had been accorded, the meeting was adjourned.

Edinburgh Photographic Society.

"Round the World with a Camera" formed the subject of the Society's third lantern exhibition, which took place on the 17th inst., in Queen Street Hall.

Andrew Pringle, Esq., who lately returned from a tour round the world, delivered the lecture, which was of a more than usually interestiug chuacter, as Mr. Pringle spoke from the results of his own experience.

The views exhibited were derived from negatives taken by Mr. Pringle in the various countries through which he travelled. As the transparencies were of a very high order, the views, illustrating so many lands, were put on the screen in the most efficient manner.

The frequent applause of the audience sufficieutly testified their complete satisfaction.

A vote of thanks was awarded Mr. Pringle for his lecture and admirable illustrations.

Talk in the Studio.

A Trip to the Great Sahara.—The *Echo* says:—"In these days of making minor trips of the 'Round the World in Eighty Days' type, it may interest some people to know that they may leave Charing Cross on a Monday morning and reach Africa on Wednesday night. Warm work this, aud pleasantly warm in such a season as we are having. For, according to a little work just published, 'To the Great Sahara with a Camera,' it is a very easy matter to leave our East winds and sunless shores, and reach the land of sand aud sunshine, where Arabs are clothed in white, and camels cast long shadows as they stalk. The little work is very amusing, besides being useful for the information it affords to those of tourist incliuation."

Alleged Piracy.—Summonses were yesterday applied for and obtained at Wandsworth Police Court against the Rev. John Erskine Clarke, the registered proprietor of *Church Bells*, for a piracy of the registered photograph by Mr. H. W. Taut, of Newbury Church. The case will be tried on Wednesday next week at 3 o'clock p.m.

Mr. Statham's Funeral.—On Saturday afternoon the funeral of the Rev. Francis F. Statham, B.A., F.R.G.S., F.G.S., rector of St. Peter's, Walworth, took place at Norwood Cemetery. The first portion of the service was performed at St. Peter's, to which the body of the deceased was borne from the rectory, and placed in front of the altar. At least 1,000 persons lined the approach to the church, and an immense assembly of parishioners filled every available part of the church itself. The Rev. S. P. H. Statham, army chaplain at Aldershot, assisted by the Rev. Sherrard Statham, of Birmingham, both sons of the deceased, officiated at St. Peter's and at the cemetery, a number of the local clergy and

Nonconformist ministers also being present. The funeral procession, consisting of a car and five mourning coaches, was accompanied by the 4th Volunteer Battalion of the West Surrey Regiment, 400 strong, with its three bands, the drums being muffled, and a detachment of the P Division of Police, the deceased having been chaplain to both. The coffin was covered with the union jack, and surmounted with the deceased's helmet and Bible. Signs of mourning and marks of respect were general in the immediate neighbourhood of the church, and the traffic had to be suspended for a time until the procession got away. At the cemetery the deceased was buried with military honours, the firing party, under Colonel A. W. Ray, being very large. A large number of photographers were present, and wreaths were sent by the South London Society and the Photographic Club.

Royal Cornwall Polytechnic Society.—Tuesday, the 12th of August, is the day fixed for opening the next exhibition. It will be held, as usual, in the Polytechnic Hall at Falmouth. Medals and prizes are offered for noaelties in photography, and full particulars can be obtained by application to the Secretary at the Polytechnic Hall, Falmouth, or to Mr. W. Brooks, Wray Park, Reigate.

Photographic Club.—On May 7th, the subject for discussion will be on "The Colour of Negatives as affecting the Positive Print."

To Correspondents.

*** We cannot undertake to return rejected communications.

D. H. Cussons and Co.—As we have not published "a paragraph drawing attention to some literary piracies," we can scarcely insert a letter which implies that we have done so.

W. B. C.—(Dublin).—If the washing is done with clean water they will be quite as good; but if the water should contain traces of insoluble matters in suspension, there will be rather more tendency towards surface stains than if the plates were prepared in the usual manner.

Ad. Eoois.—1. The apparatus you send is, as you say, not sufficiently well made for actual work, and as regards general design it resembles several which have been proposed, and more especially the camera which Mr. Woodbury proposed for use in conjunction with a captive balloon. 2. A small doublet would answer very well. 3. We hardly think it would answer your purpose to patent it, as it would be difficult to specify any definite point of originality; but you might register the general design.

G. A. Breithaupt.—1. It may be an advantage to use a weaker sensitizing bath, but if, as you say, the albumen has become rotten and decomposed, the paper should be rejected.

G. Pendry.—1. It is extremely probable that either you do not make your transparencies sufficiently vigorous in the first instance, or that the substitution process is not carried on far enough. Try to build up a heavier deposit of silver in the first instance. 2. We believe that it has not been published in full detail. 3. You will find drawings and descriptions of suitable furnaces on page 242 of our volume for 1882, and in the Year-Book for 1883.

John Hodda.—There is no single hand-book embodying that which you require, but you will find all the information as to recent progress in the last four volumes of the Photographic News, and a sufficient epitome of the matter will be found in the Year-Books. You may perhaps obtain these by advertising for them.

G. F. Webber.—1. We have no doubt that the firm referred to will readily examine the objective, and inform you if it is a genuine instrument. If it is a forgery, your friend should demand a return of his money from the auctioneers—that is, if the objective was catalogued and sold as being by the makers you mention. An auctioneer does not guarantee his goods, neither is he responsible for their condition; but as the firm you refer to makes a special feature of selling optical goods, the usual clause in the conditions of sale should not protect them in case of a forged lens, or a fraudulent imitation of a lens. If a lens is offered as being by ——— and Co., and it proves not to be such, it is a distinct and entirely different article. Should any difficulty arise, we shall be pleased to assist you, as we have recently taken an active part in suppressing the growing trade in spurious lenses. Under any circumstances, let us know how you get on.

Alfred Hay.—It would please us to be able to assist you or any other reader, but we do not know of any situation vacant just now. Perhaps if you were to advertise you might hear of something.

Ed. H. Rhodes.—They are, as you suppose, mounted in a bath of warm gelatinous solution; one part in twenty will answer. Your question about the black is not quite intelligible to us.

T. Sims.—Thanks for your letter. Could you leave a few of the specimens at the Office for us to see?

Poogle.—1. Use a sable brush worked to a fine point, and Prussian blue water-colour. Unless your eyesight is very keen, use a magnifying glass, and take care to only touch the pinhole with the tip of the brush. 2. It is not easy; indeed, we have never seen one which really did look like moonlight; but the usual course is to take the picture with the light coming as much from the front as the subject will bear, to retouch considerably, and to print on greenish paper. Genuine moonlight pictures have been taken by Mr. Henderson and others.

A Subscriber.—1. Write to Evison and Bridge, Law Stationers, Chancery Lane, London, for a set of forms. The cost is, we believe, 6d. A £1 stamp is required on making application for the patent, and a further payment of £3 will afford you protection for four years. 2. A trade mark does not protect a new invention in any way. The mark only is secured to the person registering; the article marked may, unless protected in another way, be manufactured by anybody.

G. Schultz.—It may be as you say, but we are inclined to think it more probable that traces of hypo have been carried on to the paper by carelessness in handling.

Sulphite.—The only spots which we notice are minute reductions of silver which correspond in position with spongy depressions on the glass. Probably some foreign matter has remained in the depressions, and this has affected those portions of the film in immediate contact.

S. F. E.—Your experience is interesting, but, at the same time, we can hardly find room for your remarks.

The Photographic Society of Ireland.—We are asked to state that the gentleman who, on the 18th inst., exhibited the Willesden paper to the members, was Mr. G. Pim.

J. E. Sutcliffe.—If you obtain an instrument from one of the well-known English makers you will be quite safe, as, should it in any way be unsuited to your requirements, you will doubtless be supplied with another.

MR. ROBINSON'S NEW BOOK.

PICTURE-MAKING BY PHOTOGRAPHY. Being No. V. of "Photographic Handy-Books" (See page 266, Photographic News.)—Price 2/6, per post, 2/8.—Piper and Carter, 5, Castle Street, Holborn, E.C.

The Photographic News Registry.

Employment Wanted.

Photo. Colourist, gen useful.—G. Manton, 49, Hurley-rd., Kennington-la.
Operator & Ret. in good house.—D. Predger, The Broadway, Ealing, W.
Operator and Retoucher, could manage.—Artist, I. Hove-st., W. Brighton.
Youth, as Assistant in dark room.—H. Eckhardt, 12, Bath st., Brighton.
Mounter & Cutter (lady).—B., 1, Great Coram-st., Russel-sq.
Recep.-Room, Printing, Colouring.—E. M., 1, Benhill-rd., Camberwell.
Improver, can Tint well.—A. H., 15, Arlington-rd., N.
Reception-Room, Spot, Mount, &c.—E. H. H., *Photo. News* Office.
Ret. & Assist. Operator.—M. G. A., 1, North-pl., Montrose-st., Glasgow.
Print., Spot., Toner, Mounter, &c.—Miss Smedley, 45, Gt. North-ter., Linc.
Photo. Colourist and Retoucher.—Photo, *Photo. News* Office.
Recep.-Room, 7 years' experience.—E. Smith, York House Cheltenham.
Spotting, Mounting, (lady) —K. B., 67, Colvestone-crescent, Dalston.
Retoucher, Recep.-Room, Spotting.—2, Marion Villas, West-st., Bromley.
Retoucher & Assist. Operator.—J. V., Folly Hall, Huddersfield.
Artist, as Op. & Retoucher in good house.—A. B. 19, *Photo. News* Office.
Artist in Oils & Mono —C. E. Sharpe, 28, Hardy-st., Gt. George's-sq., L'pool.
Op. & Ret., best houses Paris & Italy.—A. L. H. Puzzi, 420, Euston-rd.
Studio & Reception-Room, West End.—E. M., 1, Benhill- d., Camberwell.
Printer, &c., French, speaking Eng.—A. C., 6, St. Martin's-st., Leicester-sq.
Recep. Room & Colourist.—E. Smith, York House, Bath-rd., Cheltenham.
Op. & Ret. £3 3s. weekly.—W. H. H., 29, Black Lion-la., Hammersmith.
Retoucher & Colourist.—Operator, c/o Mr. Bradshaw, 52, Cheapside.
Artist, three days a week —Infelix, 3, York Villas, Brighton.
Retoucher, 25s. weekly.—Miss H., c/o Mr. Kent, 49, Newman-st., W.C.
Gen. Assist., 16s. weekly.—L., c/o. Mr. Kent, 49, Newman-st., W.C.
Mounter, Retoucher, Finisher.—E. R., 4, Offley-rd., Brixton-rd.

Employment Offered.

Lady, exp., Recep -room.—Hughes & Mullins, Regina House, Ryde, I.W.
Printer, well up in vignetting.—Winter, Midland-rd., Derby.
Oper. & Retoucher, good at lighting & pos.—Shrubsole, Davy-pl. Norwich.
Printer & Gen. Assist.—E. R. Gyde, Cheltenham House, Aberystwith.
All-round Hand (single).—Cuckney and Co., Rochester.
First-class Floater.—Tavistock Works, Tavistock-pl., Kensal-green.
Printing, Toning, &c.—Personally, 67, Pentonville Road, N.
Assistant Silver Printer —W. N. Malby, Chichester.
Operator and Retoucher.—W. H. Widwinter, 49, Park-st., Bristol.
Operator, wet and dry.—J. Bateman, St. George's-st., Canterbury.
Artist for India at once.—R. B., c/o Marion and Co., Soho-sq.
Enameller at once.—Oeffelein & Co., 51, Berner's-st., W.
Assistant Operator (must retouch).—J. Willis, Manor-rd., Gravesend.
Printer, to board in house alternate Sunday.—J. Willis.
Reception Room, Spotting, &c.—Lavis, Eastbourne.
Assist., to super. Print. & Finish.—W. H. A., 247, Brecknock-rd, Tufnell-pk.
Printer, Toner, Vignetter, &c.—H. Hallier, Stafford-st., Walsall.
Operator and Retoucher (part. of sell).—Taunt & Co., Oxford.
Retoucher (specimens).—Elliot & Fry, 55, Baker-st., W.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1340.—*May* 9, 1884.

CONTENTS.

THE RELATION BETWEEN FOCAL LENGTH AND ANGLE OF VIEW.

THE relation which exists between the focal length of the lens, the size of plate which it covers, and the angle of view which is included, are matters continually puzzling to photographers. This was well illustrated at a recent meeting of the South Loudon Photographic Society, at which Mr. Norman Macbeth read a paper. The question was asked: "What relation should there exist between the focal length of a lens, and the size of plate used to get satisfactory perspective?"

The question called forth many remarks, and there were to be particularly noted two. Each of these came from a man well up in practical optics, and at first sight they appeared so contradictory, that some astonishment was expressed.

The first of the two remarks was to the effect that "the *form* of a lens had no influence on the perspective of a picture, which was governed by the focal length of the lens only."

The second was to the effect that the point of view being fixed, the focal length of a lens has nothing to do with the perspective of a figure, but that only the size of the image increases with increase of focal length.

The second statement appears, at first sight, to be totally wrong, for do we not all know that if we keep the position of our camera the same, and take two pictures, one with a very long focus lens, and another with a very short focus wide-angle lens, the latter will show a strained perspective as compared with the first? Certainly this is true; but then we must consider that the small portion of the second picture which formed the first one, has not its perspective altered in the least. It is only much reduced in size so as to form a small portion of the central part of the picture taken with the wide-angle. The strained perspective is, in fact, produced by the introduction into the second picture of objects which, in the case of the first, lay entirely outside the field.

To take a definite example, let us suppose we are taking a portrait in a long studio. We use a long focus lens, and have to go the extreme length of the studio away to make the whole of the figure come into the plate. Now, we substitute a very short-focus wide-angle lens—say, a quarter the focal length of the last one. "You will certainly get a picture all out of perspective," we may hear said. So we will, but the perspective of the *figure* will be precisely what it was before. It will be only a quarter the size it was in the first picture, and will be seen in the centre of the surroundings, and of the sides of the studio, the latter being visible to within a short distance of the camera, and producing a strained perspective indeed.

We may put the result of these remarks in the following words:—The size of plate and the point of view remaining the same, alteration of focal length does not alter the perspective of an object in the picture, but alters the perspective of the picture as a whole.

The first of the two statements which we quoted involves the supposition that the size of image remains the same, whilst the focal length is altered, this further involving an alteration of the point of view.

This is a view of the case particularly applicable to portraiture. We may again imagine a specific case, and take it as an illustration.

We again imagine the long studio, with a figure at one end which we wish to take full-length. This time we try the short-focus lens first, and find that to cause the figure to cover the whole plate we have to go very close. We now certainly find the perspective strained enough. We unscrew our short-focus lens and replace it with the one of long focus. We shall now find that we take in a small portion of the figure only. The perspective of this will, however, be precisely the same as the perspective of the same small part of the image produced by the wide-angle lens.

We move away the camera till we get the image small enough. Now there is a marked enough change in the perspective. It will appear that this change has been brought about by a change in the lens. It has not been so brought about in reality, but has been brought about from the change in the point of view which the change of lens has permitted to be made without dwarfing the image.

Disregarding for a few moments the point of view—or rather, perhaps, we should say, considering it fixed—we cannot be too emphatic in our statement that the perspective of a picture in no way whatever depends on the *form* of lens used. With a 12 by 10 plate, and a lens of twenty-four inches focus, we will get a picture with precisely the same perspective, whether we use a portrait lens, a universal lens, a rapid landscape lens, a symmetrical, a single, or, in fact, any kind of lens whatever. Apart from differences of definition (especially marginal) and of depth of focus, the only difference between one image and another will be, that the one produced by the single lens will show the least possible amount of distortion—certainly not perceptible with the relation of focal length to size of plate which we have mentioned. In fact, were the equivalent foci of all the lenses really precisely the same, all the negatives might be superposed; and it is probable that no point of the image of one would miss covering the corresponding point in another by more than a sixteenth of an inch.

We have very frequently of late advocated the use of single lenses; but it must be distinctly understood that they offer no advantages in the way of perspective which are not afforded by any lens of the same focal length. The advantage of the single lens is, that when we come to a case requiring a long focus, it will do for most subjects (including por-

traiture) as well as a more complicated lens; it displays one distinct superiority in having but two reflecting surfaces, and it is comparatively cheap.

THE ROYAL ACADEMY.

PORTRAITURE and figure study is always a main feature at Burlington House, but taking a general view it does not appear to us that the work of this year is so excellent as to do much credit to the British painters of the present day. That painters of the highest standing make use of photographs as guides in figure painting and portraits is well known; and indeed this practice is on the increase. It is curious to notice, however, that the bad points of the photograph, rather than excellences, are generally transferred to the canvas. We notice the stiff and ungainly attitudes of unskilful posing, and it is quite clear that painters often copy those distortions which result from a careless use of the camera and lens.

"Treasures of the Home," by J. R. Herbert, appears to represent a woman carrying two children away from the scene of a fire, but although her hair is represented as streaming behind, the attitude is one indicating stillness and inaction; and the elder child, although apparently wide awake, is held as no living child could be carried; it would, however, be possible to carry a lay figure in the way represented. "Idle Moments" (No. 15), by C. E. Perugini, is a figure study which seems quite familiar. A sentimental young lady with a high-placed belt, and head leaning a little on one side, holds a peacock feather in the usual oblique position. The left arm, however, appears to us somewhat longer, and the left hand (which projects) somewhat larger, than is usual in productions of this type. The title of "Children of Arthur Pease, M.P." (No. 36), by James Sant, R.A., might well be called "Posing for a Photograph," and although the scene is laid in a wood, the figures forcibly recall the glass room. The boy holds a basket of fruit, but he does not seem to be aware of the fact, as both he and the girl seem to be intently regarding some object which we may suppose the photographer has told them to look at, while the girl seems to be offering an apple to somebody who is in front of the canvas. A portrait of Irving, an exact ninety degree profile, by J. A. Millais (No. 372), represents Mr. Irving as completely lifeless and soulless, with his hand in his pocket; we have seen better pictures of the great actor sold for sixpence each. Next to this is Miss Mary K. Benson's "Kittens" (No. 371), a charming little study of a white pussy-cat and its little mistress; while a little higher and to the right we notice a strange picture, "Master of his Horse," by Scholderer (No. 375). It represents a little wooden boy riding on a wooden horse. One can hardly conceive of a contest between them.

We cannot say much in praise of Frank Holl's portrait of the "Prince of Wales" (No. 298), as the position is stiff, and the lighting is quite in the theatrical style. As the flood of illumination that comes from the light brightens the figure without touching the accessories, it is difficult to divest oneself of the notion that the Prince is standing before a painted scene. Perhaps the most striking example of that style of portraiture, in which the figure looks directly forward out of the canvas with a meaningless stare, while the surrounding objects are supposed to indicate the tastes of the model, is No. 131, a portrait of Mr. Fleetwood Wilson, by J. E. Millais, R.A. But we are glad to pass on to more pleasing subjects, among which we may mention Nos. 489 and 496, by Ellen Montalba.

Two child portraits, "Winifred Cooper" (No. 700), by Mary L. Waller, and "Grettie" (No. 635), by Hugh Cameron, impressed us very favourably; while Otto Scholderer's portrait of Mr. Hermann Magnus (No. 812) is a fine example of portraiture, the attitude being remarkably easy and unconventional.

Among the more elaborate compositions, "Loading at a Quarry" (No. 137), by H. T. Wells, R.A., is well worthy of careful study, especially by photographers. It is accurately drawn; the postures are easy and natural; it shows a full contrast of light and shade; while not one of the figures (five men, four horses, and one dog) seems to be aware that he forms part of a picture, and not one is looking out of the canvas. With this we may contrast No. 798, a representation of "Daniel in the Lion's Den," by Robert Thorburn. A very robust-looking angel seems to be vehemently defying the visitors to the Academy, while Daniel stands a little behind, looking a trifle uncertain as to his personal safety. The angel and the lions seem altogether unmindful of each other's presence.

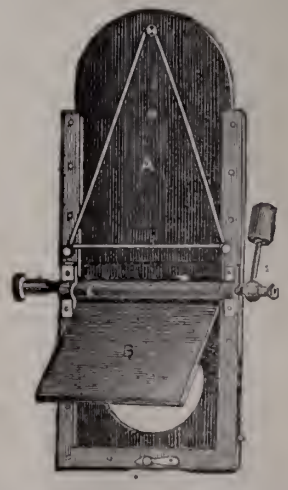
"Venetian Life," by Luke Fildes (No. 390), is a splendid study. A group of seven young women or girls, seated at the open doorway of a waterside palace, are engaged in ordinary feminine occupations; but work seems to be merely an excuse for idleness and gossip. An old crone far back in the shade, and engaged in combing the long hair of one of the girls, forms an effective foil to the other figures.

There are not many representations of those rich and verdant fields and lanes which form the chief charm of our country, but, as we observed last week, there are excellent pictures of the sea. We referred to Mr. Henry Moore's "Off the Bill" (No. 577), a bright little picture of the ever restless sea, but so badly placed as to be almost unnoticed by many visitors; and "Off the Lizard," a most characteristic example of his work. The little fleet of fishing boats carry with them the idea of motion and activity. Mr. Colin Hunter's "Herring Market at Sea" is probably the best piece of work this artist has produced, the rich blue and clear bright lights being particularly effective in their contrast.

Altogether the Academy is well worth a visit, and no photographer who is in London can well afford to lose the opportunity of profiting by the lessons (both positive and negative) which it teaches.

REYNOLDS AND BRANSON'S SHUTTER.

WE have already described the earlier form of this apparatus, and we may now call attention to some modifications which have proved to add to its usefulness. An adjustable arm with a weight shown on the right-hand side of the diagram



serves to lift the flap, this arrangement being more convenient in ordinary cases than the more complex spring with a tension adjustment. As soon as the flap B is raised, the drop A falls, its motion being accelerated by an elastic band placed as shown.

PHOTOGRAPHY OF COLOURS IN THE TRUE PROPORTION OF THEIR INTENSITY.

ADDITIONAL NOTE BY DR. H. W. VOGEL.

In the formula of the first silver bath (sensitizing bath) given in the last number of the News (page 274), I forgot to mention the alcohol—2 to 3 per cent. of pure alcohol of 96°, that is, 10 to 15 cub. cents. for the quantity of bath mentioned should be added. The alcohol is necessary for avoiding streaks, as the dyed film repels the silver solution much more than an ordinary one.

On the other hand, it is always necessary to test the acid action of the two baths with litmus paper. It must be borne in mind that eosine has an alkaline reaction, and neutralizes the bath.

[Dr. Vogel has recently made a successful application of his method to gelatine plates.—(See page 296.]

MATT PICTURES ON ORDINARY ALBUMENIZED PAPER.

An increasingly larger proportion of the public now prefer to have photographs with a matt surface, especially where large pictures are concerned, and it is a desideratum to have a simple method by which these may be produced without involving any considerable change in the routine of the printing room. It is true that pictures without gloss may be obtained by sensitizing the back of ordinary albumenized paper instead of the face; but such prints become very much weakened during the operations of toning and fixing, and the raw surface of the paper does not give a satisfactory face to the prints.

In the *Wochenblatt* we find a suggestion of Herr F. Wilde to sensitize the albumenized paper upon a special ammonia nitrate of silver bath, which so far disintegrates the albumen as to make it yield prints with a very pleasing matt surface. All other operations are conducted as in the case of ordinary printing.

To prepare the ammonia nitrate sensitizing bath, one part of nitrate of silver is dissolved in eight or ten parts of water, and sufficient liquid ammonia is added to re-dissolve the precipitate which is thrown down at first. A solution of citric acid, containing one part of the acid in ten parts of water, is then added to the ammoniacal solution until a faint turbidity which does not disappear on agitation, is produced. A volume of ether equal to one-tenth of the bulk of the silver solution is next added, and the sensitizing bath is ready for use.

At Home.

M. CHAZAL AT CONSTANTINE, ALGERIA.

Those who have seen a picture of Magdala, King Theodore's stronghold, perched upon a precipitous rock, where he kept the Abyssinian captives, may form a pretty good idea of what Constantine is like. As you approach the town by railway, the line climbing the broad valley in sinuous turns, you are suddenly surprised to see opposite you a huge table rock of red stone, its flat top covered with multitudinous roofs. For some time there has not been a habitation visible, only huge boulders, and now and then a mountain torrent, attracting the eye, in the broad inhospitable landscape. And now before you appears a packed mass of habitations, as if built by human swallows, covering the rock so densely that there is not space for another brick or tile. The railway circles round this rock, but when your train comes to a standstill, there is still a deep ravine between you and the city.

A light stone bridge takes you into the town, perhaps the largest Arab city in the world. For the Arab population here greatly outnumbers the Europeans, and, except in two or three of the broadest thoroughfares, the streets and courts are intensely native. Constantine is the capital of the province of that name, and forms part of Algeria, but it is closer to Tunis than to Algiers, and altogether is very Eastern in its character and population.

We were fortunate in possessing a few lines of introduction to M. Chazal from our esteemed correspondent, M. Léon Vidal, of Paris. A personal friend of the latter, M. Chazal was good enough to receive us very kindly, and as an intelligent experimentalist, no less than as an able photographer, he proved an exceedingly welcome acquaintance.

M. Chazal has had some interesting experiences in his time. In 1855 he photographed the progress of the Lyons railway then in course of construction; afterwards he went to Paris, and engaged in much experimental work connected with photography; then he journied to Africa, and spent some time in Tunis; and now he has settled in Constantine, where the Arab life is especially congenial to one with such roving instincts.

The recent war between France and Tunis, which upset the government of the latter, and made the Tunisian empire a sort of department of France, has not benefitted M. Chazal, for he was an intimate acquaintance of the Bey. For fifteen months, indeed, M. Chazal was an inmate of the palace at Tunis, for the Bey's brother is an accomplished photographer, thanks to our host's tuition. Very soon the Bey came to appreciate the value of photography, and, like a wise man, he cast about for a thorough master who could teach the art, root and branch. His brother, however, proved the more apt pupil, although the Bey himself was so imbued with the importance of photography, that he decided upon establishing a private studio for himself. M. Chazal was sent for and given *carte b'anche* both in respect to construction and expenditure, and the consequence was that in a few months the Bey's palace at Tunis boasted one of the most complete photographic establishments. The ruins of glorious old Carthage—or, rather, what is left of them—are very close to Tunis, as every student of the classics knows full well, and this spot afforded plenty of scope to the Royal photographers.

Naturally, M. Chazal loves to speak of his Tunisian experiences, and there are probably few French colonists who possess such a deep and thorough knowledge of the Arab character as the Constantine photographer. Nor must it be imagined that he neglects photographic progress in the study of native character. The whole series of the French *Bulletin de la Photographie* are to be found in his studio, and one of the first questions M. Chazal addressed to us bore reference to a process for producing incombustible transparent prints, that had recently come under the notice of the Paris Society.

In his studio, M. Chazal only works in the morning. Portraits are taken as early as the sitter pleases, but rarely are any sittings given in the afternoon. The light is naturally very powerful, both summer and winter, and although his atelier is situated in a dark turning out of the main street, he has to adopt many precautions in the studio itself. Thus all the side light comes through ground glass, while the top light consists of white light throughout, screens and banners being employed for still further subduing the illumination where necessary. Again, the shading of the camera is undertaken with great care, a large hood of thick black cloth enveloping the apparatus most completely, so that no stray ray of light can search out any weak points in its construction.

But if, in M. Chazal's studio, the illumination is subdued, his dark room is light enough. Indeed, we have never entered a more orderly, cleanly, spacious, and less gloomy dark room in any private establishment. M. Chazal has no less than three windows in his dark laboratory, and his idea on the subject is a very sound one. He has his windows, which are by no means small, covered with orange and ruby fabric, one of the most non-actinic of combinations; in a word, he gets the most safe light he can, and then admits plenty of it. It is in this respect that

many photographers make a mistake. They cover a tiny casement with this lugubrious combination, and then boast that they can develop a plate without the least fear of fog. They are quite right in their dictum; only if the light is not sufficient to act on the plate, neither is it sufficient to let them see it. Why have any light at all under the circumstances, since it does not permit you to see what you are doing?

M. Chazal, then, as we have said, goes in for a very sombre light, and has plenty of it. For portraiture, when you have plates you can depend upon, development is little else then a mechanical operation; but it is another matter altogether when dealing with landscapes, and when two plates are never exposed under precisely the same conditions. Before each window M. Chazal has a broad shelf, where you may rest frame or developing dish at any moment, while the laboratory is at the same time so roomy that you may retire to some distance from the windows when it is a question of changing plates or performing any operation where light is not only unnecessary, but particularly harmful. All the shelf and table room, too, we noticed, was not only scrupulously clean, but altogether unencumbered.

M. Chazal makes use of a very fine heliostat for multiplying negatives, or copying them; not that the instrument is essential to the work, as he informed us, but because, having the apparatus at his disposal, he availed himself of its valuable aid. Of course he employed gelatine plates in his work, giving a preference to those of English make, albeit those were very dear by the time they came out all the way to Africa. English cabinet work was also eulogised by M. Chazal. "We cannot get such fine workmanship among our camera makers as you have in London," said M. Chazal, and then he went back to refer to the model studio he had left at Tunis Palace, where the lenses and apparatus were by English makers, and where he had been at some pains to choose of the best. Still, M. Chazal had little to grumble at over his own apparatus, and one camera-stand especially, a tall tripod for landscape work, particularly attracted our attention for its stability and thoroughly serviceable aspect. "Yes, that is a good stand—one of my own make;" and then he added, smiling, as we landed its firmness, that it was strong enough to hang a man on.

M. Chazal experiences one drawback in living among the Arabs: you cannot get any assistance from them. A printer or studio attendant cannot be taken from among the natives unless you are willing to submit to all sorts of inconveniences. That is to say—to employ and support one man, is to support all his relations, his father and mother, sisters, cousins, and aunts. Nay, your servant's servants have to be provided for; for as Thackeray used to say of Irish gentlemen, you could never find one so poor that he had not a dependant in his train, so, seemingly, the natives here are none of them so humble that they have not a troop of female relatives and attendants. It is true, said M. Chazal, the workmen cost very little, but then they work very little; and after many experiments he has found it impossible to employ anyone but his own country-people.

THE SPECTROSCOPE AND ITS RELATION TO PHOTOGRAPHY.

BY C. RAY WOODS.

VII.—Sensitizers, and the Action of the Spectrum on Salts Used in the Printing Processes.

So far we have simply been considering the effect of the spectrum on the haloid salts of silver alone, and in the obtaining of a negative picture; but before leaving this subject, it will be well to note what effect is produced by the addition of other substances, notably dyes, a subject that is at present engaging considerable attention. The effect of sensitizers in the film—that is to say, sensitizers the only function of which is to absorb the halogen freed by the action of light—is, in most cases, simply to decrease the time of exposure by increasing the sensitiveness of the compound in the film. When used with a film containing a mixture of two or more haloid salts, they perform another function. The decrease in sensitiveness at a part of the spectrum, caused by the action of one halogen set free on the compound of another halogen with silver, is removed. This will be seen by a reference once more to fig. 8, Nos. 7 and 8, showing the effect produced when nitrate of silver is present as a sensitizer to a mixture of iodide and bromide of silver. In such a case as this, the sensitizer takes up the halogen as soon as the light sets it free. It may be remarked that gelatine is too feeble a sensitizer to produce such an effect in any marked degree, and it may therefore be noted incidentally here, that whatever be the cause or causes of the sensitiveness of modern dry plates, the function of gelatine in inducing sensitiveness would appear to be physical rather than chemical.

The addition of certain dyes to films containing sensitive compounds has the effect of increasing the sensitiveness of those compounds to certain rays; in most, if not all, cases, to those rays which the dye absorbs. It is a debated question as to how this takes place, whether the dye, by absorbing the light, causes it simply to act more energetically on the silver salt, or whether the dye itself undergoes a change. It has been pretty well ascertained that those dyes only which are not permanent, can act as "optical sensitizers"; "colour sensitizers" or "local sensitizers" would, perhaps, be a better term. The action of these colour sensitizers is greatest when a chemical sensitizer is also present; but the latter is not indispensable, as many dyes possess this property as well. To mention briefly a few dyes that give a local increase of sensitiveness, we have:—Coralline, increasing the sensitiveness to light blue near F; aurine, increasing the sensitiveness to the green; aldehyde green for both yellow and blue; methyl violet for the yellow near D; eosin, increasing the sensitiveness in the green between E and F; cyanine blue for the yellow and orange-yellow, about D and C. Of these the last two are the most important; but until lately it has been found that the sensitiveness in the parts of the spectrum where the dye absorbs is still not greater than at the natural maximum of the haloid salt.

In the preceding articles of this series, it was stated that, "since the yellow rays have the greatest effect upon the eye, the photographer would obtain results more nearly approaching to what he sees in nature by using a medium more sensitive to that part of the spectrum than to any other." It will be seen, therefore, that the influence of dyes in the film is of considerable importance. Its importance is pretty generally recognized so far as the photographing of paintings is concerned, and the use of dyes has in this direction been attended with beneficial results, in spite of the fact that the local sensitization has hitherto been far below the amount desirable. Dr. Vogel's recent claim to have produced plates twenty-five times as sensitive to the yellow of the spectrum as to the blue, if substantiated, should be productive of most important results, and the photographic world, if fully alive to the benefits attainable, will bear with some impatience the short time that must elapse before they can obtain the material with which they can try Dr. Vogel's process.

It remains now to consider the effect of the spectrum on sensitive compounds in relation to printing processes. In this we have to consider the action of light on silver chloride in the presence of nitrate of silver and organic matter; the action of light on iron salts, on which the blue process and the platinotype are based; and the action of light on bichromate of potash, on which the carbon process is based. These are the most important compounds with which we are accustomed to deal.

In the reducing action of light on the haloid salts of silver there is little difference between the result produced by printing and that by development, so far as the extent of action of the spectrum is concerned, the maximum re-

maining in both cases the same. Bromide and iodide of silver not being adapted for printing purposes, on account of the comparative feebleness of the image compared with that of the chloride, may be dismissed. The effect of the spectrum on chloride of silver on paper in the presence of nitrate of silver is shown in the accompanying diagram.

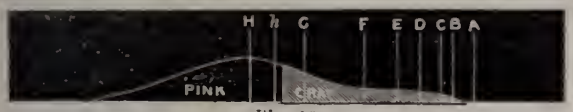


Fig. 10.

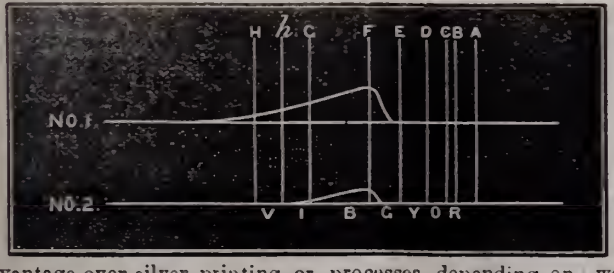
It will be seen that the more refrangible part of the spectrum, beginning from a point almost midway between H and G, a little less refrangible than *h*, darkens the paper to a somewhat pinkish or ruddy hue. Below *h* the tint produced is greyish. In the ordinary silver printing process we have other compounds of silver present, notably the albuminate. It will be found, however, that the most refrangible rays darken the paper a ruddier tone than do the less refrangible rays, whether commercial ready-sensitized paper be used, or the paper be sensitized when required. This is the general rule, though different papers will give particular differences under the action of light. The difference in colour produced by different rays will explain several phenomena with which everyone is more or less familiar. Let us, in the first place, consider the subject of printing by the electric light, as this will make what follows plainer.

Those who have tried printing by the electric light must have noticed what ruddy pictures are obtained. This is undoubtedly due to the quantity of rays of high refrangibility emitted by the arc light. Further, the same amount of contrast is not obtained that may be got when printing by diffused daylight, or even by the direct rays of the sun, and defects in the negative which hardly appear when printing by the sun, come out forcibly under the light from the electric arc. It would appear that the ruddy compound produced by rays of high refrangibility is more opaque to ultra-violet rays than the grey form, so that whilst the rays are slowly penetrating the reduced surface, they have time to penetrate through the dark parts of the negative. There is nothing to be surprised at in this when it is remembered that metallic silver in a thin film (as in the mirrors used by astronomers) is transparent to some of the ultra-violet rays.

This will explain the advantage found in printing by diffused daylight in preference to the direct solar rays, especially with weak negatives: the light reflected from the clouds having been deprived of some of its ultra-violet rays. Again, negatives developed by ferrous oxalate, print redder than negatives developed with alkaline pyro, the yellow stain of the latter cutting off some of the more refrangible rays.

The action of the spectrum on iron salts can be dismissed in a few words. The action is very similar to that of the spectrum on bromide of silver.

The carbon process possesses a very considerable advantage over silver printing or processes depending on the reduction of iron salts. The above diagram* will show that the maximum effect of the spectrum on bichromate of potash is near F, in the light blue. The carbon process can therefore be worked in a much weaker light than either silver printing or platinotype.



* From "Instruction in Photography" by Captain Abney.

Review.

Photo-Micrographs, and How to Make Them. Illustrated by 47 Photographs of Microscopic Objects, Photo-micrographs, reproduced by the Heliotype Process. By George M. Sternberg, M.D., F.R.M.S.—(*Boston: J. R. Osgood & Co.*), 1883. Price 15s.

Dr. Sternberg's name is well-known to scientific men through his researches on the Bacteria and other kindred organisms, and their connection with infectious diseases. For some years he has employed photography for making memoranda of his work; for, spite of its shortcomings, photography far excels the engraver's tool in truthfully delineating what is seen in the microscope. Microscopists generally cannot fail to be grateful to Dr. Sternberg for giving to the world, in the present volume, an account of his method of working, together with directions for preparing and photographing a large number of interesting and important objects. It is a book that can be *read*: not merely a work of reference: not bristling with technical descriptions given in the driest of scientific styles, but a book which the youngest student will devour with pleasure: a book to awaken and sustain enthusiasm. It is popular in style, yet scientifically exact, while much of the information given relating to the lowest organisms will be new to many. It has been the fault of most of the works on the microscope published in this country and America that few of them have been anything but dry compilations. This work bears the stamp of originality from beginning to end.

The book consists of two parts. Part I. Technology, treating of light, apparatus, exposures, development, selection, and preparation of objects for photography, &c. Part II. contains the plates, with an interesting and exact description of the objects photographed; in fact, as Dr. Sternberg says, this part might properly bear the title of "Elementary Lessons in Biology." Such an interesting, and at the same time scientific, course of lessons has never before been published.

In his introduction, Dr. Sternberg gives a very necessary caution respecting the use of the words photo-micrograph and micro-photograph, which many persons use as synonyms. "Photo-micrographs," says Dr. Sternberg, "are sun-pictures of microscopic objects, more or less magnified. A micro-photograph is a microscopic picture of an object which can be seen by the naked eye." Again, "micro-photographs are simply curiosities in the art of photography, and are to be viewed under the microscope."

Another very important point is insisted upon: that success in photo-micrography depends on the operator's skill as a *microscopist*, rather than on his ability as a photographer. While we agree with this, we can hardly go so far as Dr. Sternberg in saying that the microscopist can claim as his own production a photo-micrograph which he had exposed in the camera, but which had been developed and printed by another. Now, as Dr. Sternberg says, as a rule, a photographer who is unacquainted with microscopic work is not a fair judge of a photo-micrograph; thus, as he does not know what is seen in the microscope, he cannot tell what to pay special attention to in the development of the plate, nor in the production of the print. Too much, we think, cannot be said against the lazy habit of some photo-micrographers, in being content with exposing the plate, and leaving all further results to a professional photographer, who can hardly be expected to be familiar with the forms of diatoms or bacilli. Neither can we agree

with Dr. Sternberg that the photo-micrographer should hand over his negatives to be printed by any ordinary photographer, for the reason that "silver prints can be obtained more economically than the amateur can make them himself." In these days, when such good results can be got on ready-sensitized paper, which can be obtained at a low rate everywhere, we would advise the microscopist to master silver printing, if he wishes to get the best possible results; he will certainly find nothing to grumble at on the score of economy.

Dr. Sternberg does all his photographs by sunlight, using a heliostat, to give the rays of light a constant direction. Doubtless this method is infinitely preferable to any other, when it can be adopted; but in this country the uncertain nature of the sunlight, together with the mists that frequently obscure the air, compel us to fall back on artificial light for microscopic photography; yet we can confidently assert that the best work of some of the English photo-micrographers has never been excelled in any country. We do not speak of difficult *feats:* in this, the skill of Dr. Woodward, of Washington, is unrivalled.

The duration of exposures in the microscopic camera varies with each individual worker; but most photo-micrographers will be astonished to learn that at Havana, *using wet plates*, Dr. Sternberg found eight seconds to fifteen seconds ample exposure for Zeiss' $\frac{1}{18}$ inch homogeneous immersion lens! Using a Beck's $\frac{1}{4}$ inch, and an amplification of 400 diameters, the exposure was almost instantaneous! In fact, for low powers, Dr. Sternberg tells us he frequently uses a drop-shutter. For development, he prefers ferrous oxalate, a developer not much in favour here, and which in our hands seems more especially unsuitable for microscopic work. A peculiarity of Dr. Sternberg's practice is, to place the plate in the developer, and leave it there to develop itself, while he attends to the exposure of other plates. We can hardly think that the best results can be gained in this way. Captain Abney considers development an *art:* most practical men will agree with him, and condemn Dr. Sternberg's practice.

Dr. Sternberg follows Dr. Woodward in dispensing with the eye-piece in photography. He uses, however, an amplifier. More light and more rapid exposures are thus gained; but it is not correct to say that good results will not follow the use of the eye-piece. We have seen many photographs produced with the eye-piece that are certainly equal to any of Dr. Sternberg's; but for powers above $\frac{1}{4}$-inch or $\frac{1}{5}$-inch, it is best to use a long camera, and discard the eye-piece, simply for convenience sake.

On the subject of lenses, we are not at one with Dr. Sternberg, who advises the use of low-angle lenses for nearly all kinds of work. Now, wide-angle lenses have far greater resolving power than low-angle lenses, admit vastly more light, but have less penetration and a shorter working distance. Do these latter constitute any serious objection to the use of wide-angle lenses? We think not. A wide-angle lens may be made equal in penetrating power to a very low-angle lens, by the simple expedient of using a contracting diaphragm, such as the "aperture shutter" of Mr. Davis, author of "Practical Microscopy," which answers admirably. True, the working-distance is not increased, but for photography this does not matter. Our own experience has been that for *all* purposes, the *widest possible angles are best.* A lens that will resolve a diatom satisfactorily with central light is far less trouble to use than a low-angle one, of the same focal length, that requires light of absurd obliquity to do the same work. The objection to the short working-distance of wide-angles is disposed of by the fact that cover-glasses are now made of extreme thinness, and objects can be had specially mounted with such thin covers that a dry $\frac{1}{50}$-inch can be focussed upon the object without touching the cover-glass. However, Dr. Sternberg acknowledges that for special work, requiring great resolving power, wide-angles are really necessary.

In Part II., Dr. Sternberg tells us that the plates have been selected "not only for the purpose of showing what photo-micrographs are, how they are made, and what microscopic objects are best suited for photography, but also with a view to conveying, by the pictorial method, some elementary biological information." "The general truth which these photo-micrographs are intended to illustrate is, that *the lowest living beings are* UNICELLULAR ORGANISMS, *and that the tissues of higher plants and animals are made up of* CELLS.

Coming now to the plates, we wish to say that, while some are highly commended, and others criticised less favourably, they are *all good;* not one is unsatisfactory. In fact, all the plates represent in the most truthful manner the appearance of the objects as seen under the microscope. Evidently the originals have lost little by reproduction in heliotype.

We would call attention to plates 5 and 6, blood corpuscles, which are remarkably successful photographs of a difficult subject. Plate 7 has photographs of pollen, which must not be compared with photographs of flatter objects, as all spherical bodies are very difficult to exhibit satisfactorily in the microscope. The photos on plate 8 show the epidermis of plants, and exhibit the stomata, &c., in a characteristic manner. Dr. Sternberg has been exceedingly successful with plate 12, which is a marvellous production, when the difficulties to be overcome are considered. It is a photograph of the fourth square of Möller's diatom type-plate, × 50, and exhibits no less than 90 diatoms, all in sharp focus. It is a photograph that speaks well for the skill both of preparer and photographer, as well as for the splendid defining qualities of Powell and Lealand's $\frac{1}{4}$ inch.

For plates 13, 15, and 16, we have not such commendation. Good as they are, and making due allowance for the defects of the heliotype process, we think these photographs could have been done much better; and those who have seen the superb photographs of the same diatoms by Dr. Maddox will think the *coscinodisci* on plate 15, poor. The concluding plates, illustrating animal parasites, are good. Many of these creatures, owing to their natural transparency, which is much increased by mounting in balsam, are difficult subjects to photograph satisfactorily; and the brief exposure they require is such that it is often hard to bring the negatives up to printing density.

We have given but a faint idea of the attractiveness and value of the work. It is indispensable to the beginner who wishes not only to amuse himself by photographing pretty objects, but also to gain some valuable biological knowledge, and at the same time to place on record the results of his observations; while the expert will read it with interest, and also pick up many a hint for future practice. We most decidedly recommend all engaged in photo-micrography to obtain the work, which is by far the best on the subject that has yet been published.

ON LENSES.

BY W. E. DEBENHAM.*

A NEW departure was made by Steinheil in January, 1867, when he introduced the lens which he called "aplanatic." I think it only just to express my belief that photographic history will accord a place to the genius displayed in the various introductions of Steinheil only second to that of Petzval. The peculiarity of this lens consisted in the glass of which it was composed being of two kinds of flint—light and heavy—instead of crown and flint as previously. By this means it was possible to so far reduce the spherical aberration that a much larger aperture could be employed than with any previous cemented photographic combination. This lens, with a power of light unequalled in any previous combination—except, of course, the portrait lens—had its field considerably flattened, and embraced a rather wide angle. The instrument is symmetrical—that is, the back and

* Continued from page 285.

front are alike. The lens has had the sincerest flattery bestowed upon it in the manner in which it has been imitated by all the leading photographic opticians. Differences of workmanship, of

Steinheil's "Aplanatic" Lens, rapid form.

Steinheil's Wide-angle "Aplanatics."

course, influence the results produced by different makers, but it is very doubtful whether any improvement has arisen from any little variations from the original calculations that may have been adopted by any particular manufacturer. The landscape and wide-angle aplanatics by the same optician have met with similar flattering treatment by other makers, though not, perhaps, to so great an extent.

We now come to another lens of Steinheil's which is as yet scarcely known in this country. It is, or rather, they are—for there are two distinct varieties—called the "antiplanatic." One of them, called the "group antiplanatic," consists of two cemented combiuations set so closely together as only just to allow of the insertion of the diaphragm. The front lens is of shorter focus than that of the whole combination. The back lens, when looked through diagonally, diminishes very powerfully, and lengthens out the side pencils of light proportionally.

Steinheil's "Group Antiplanatic."

Steinheil's "Portrait Antiplanatic."

By this means the field is much flattened, and the spherical aberration is so far remedied that it has an angular aperture giving a rapidity about equal to what would be No. 2½ on the universal system—less than half that of an ordinary rapid portrait lens. No doubt it will work better with rather a smaller opening, but for large portraits it is seldom, if ever, desirable to use a stop giving more rapidity than No. 3; and with our modern rapid plates smaller stops than this are generally employed. For ordinary portrait use it seems to me to be a very suitable instrument. However, I should judge that it is rather a difficult and expensive instrument to construct; but, unless other makers are deterred by these considerations, I should by no means be surprised to find it largely adopted as a model.

The so-called "portrait antiplanatic" has the back elements separated like that of Petzval; but, like the group antiplanatic and the orthoscopic, the back as a whole is negative. Astigmatism has been wonderfully got rid of; but there is an amount of curvature of field which renders it unfit for working upon a large field, for which, however, it is not intended.

Lenses there are—and very good ones, too, some of them—bearing other names than those I have mentioned, and some photographer may think that I have omitted speaking of his pet instrument. If he will carefully examine that instrument, however, it is probable that he will find it included in one of the types described. Where the difference is not marked, and the particular details of construction have not been published, it could not be expected that they should be here specified.

Having now gone through these types, the question arises—"What is the best lens to use for any particular purpose?" To say that for rapid portrait work the Petzval form still holds its own, and that for landscape—when rapidity is not required—the old single view lens is hard to beat, seems to suggest that no improvement has taken place within the last forty years. It is, however, in lenses for other purposes that improvements have taken place. If it be desired to obtain the most perfect delineation of any particular subject, including near and distant objects, irrespective of size of picture, that will be best secured by a lens of short focus. If it be desired to cover a certain sized plate, and there be a latitude in the amount of subject to be included, or in the distance from which it may be photographed, choose a lens of long focus. This is particularly the case with instantaneous views, where a small stop cannot be employed, and for these reasons:—The field of a lens such as must be used is always curved. Now the longer the focus the larger the curve, and a line of any given length—the side of the plate—will line nearer to the circumference of a large circle than of a small one. The views of yachts in full sail now shown were taken with a Steinheil aplanatic of about seventeen inches focus. The length of the plate is about one-half that of the focus.

For portraiture, for the same reasons, flatness of the curve of definition, less departure from the focal plane, and the use of as long a focus lens as will take the subject of the required size, will conduce to the general sharpness of the result. An occasional objection to the use of a long focus lens for portraiture is, that in certain weather, especially in towns, the fog or illuminated smoky atmosphere between the lens and the sitter destroys the brightness of the image, and the nearer the subject can be approached, the less this is felt.

For copying flat surfaces, to avoid the curved field, the longer the focus the better, and I think that for this purpose a lens might be introduced having its normal field—that for parallel rays—convex. Astigmation and spherical aberration might abound, but stopping down would do a great deal to get rid of these evils, and for even delineation all over the picture, it is better to be *in* a rather bad focus, than to be a long way *out* from a very good one. For architectural subjects there are to choose from, the flatter curves of the modern lenses made upon the symmetrical aplanatic plan, and the rounder curves of the earlier lenses that have been described. For very wide angles the rounder curves have an advantage in transmitting more light towards the edges of the field, as it strikes the lens nearly at right angles, and so less is lost by reflection. The flatter lenses, however, have less spherical aberration, and thus permit of a larger diaphragm being used; but when a very wide angle is desired—unless in the case of an interior, or with the sides of the subject advancing considerably—a small stop is absolutely necessary for good definition.

In addition to the panel portraits taken with the single Grubb lens, I have here some of the same size taken with the Steinheil aplanatic, and some promenades with a very similar instrument—the euryscope of Voigtländer. Here are also photographs of a sitter with accessories and scenic backgrounds, taken with eight different lenses without altering the position of the camera. These were all worked with apertures No. 3 on the universal system, and it will be seen that there is little difference in the results when thus brought to the same level. The lenses are portrait lenses by two good makers—a Euryscope, a French lens on the Steinheil aplanatic pattern, an antiplanatic portrait, and an antiplanatic group, both, of course, by Steinheil. Here are also some scenes taken by Mr. Haddon with a euryscope of eight inches focus. Although the plates are nearly of the same length as the focus of the lens, the definition is remarkably good. Of course, when this angle is included, a small stop is used.

Addendum.—I have been requested by a member to state how to calculate the focus of two lenses when combined in a doublet. Make the focal length of each lens the denominator of a fraction whose numerator is unity, and add. To those unaccustomed to

arithmetical calculations, an example may make it clear. Say that two lenses, one of 12-inch and the other of 10-inch focus, are to be combined. Add $\frac{1}{12}$ to $\frac{1}{10}$ by bringing them to a common denominator; that is, $\frac{5}{60}+\frac{6}{60}=\frac{11}{60}$. Now reverse the fraction $\frac{11}{60}=5\frac{5}{11}$, and the lens is found to have a focus of $5\frac{5}{11}$, or just under $5\frac{1}{2}$ inches.

If one of the lenses be a concave, the operation is similar. Let the convex lens be of 5 inches focus, and the concave one 6 inches negative; then $\frac{1}{5}-\frac{1}{6}=\frac{6}{30}-\frac{5}{30}=\frac{1}{30}$. The compound has a focus of 30 inches. Separating the lenses will make a difference in the result, but not to an extent likely to mislead the photographer, who wishes to provide himself with a set of lenses of different length of focus.

Notes.

Mr. Norman Macbeth is not the only artist of reputation who has spoken in glowing terms as to the value of Mr. H. P. Robinson's new book. "Picture Making by Photography" is one of those works from which every photographer can learn something of real value.

A further note from Dr. Vogel regarding his process of photographing colours in their true proportion well be found on page 291, and we are pleased to be able to state that we may shortly hope for valuable information as to the application of Dr. Vogel's methods to gelatine plates. In a private letter he writes:—"After my first experiments I dare not venture to hope that I could do the same with the gelatine plates as with the wet collodion process. But now I have tried a new dye, made by myself, a derivative of aniline. This dye sensitizes gelatine emulsions in a most remarkable manner, not only for green and yellow, but also for orange and red, and whilst all dyes added to emulsions diminish the general sensitiveness for white light, this new dye improves their general sensitiveness and the intensity of the picture. The plates covered with the dye are not only valuable for reproducing oil paintings, but also for portraits, for red-haired and freckled faces, variegated costumes, &c."

New applications of photography to science are constantly being made, and such photographic observations as those of M. Henry on the position angles of various double stars will acquire increasing value as time goes on, and other records are obtained which throw light on such variations as may take place, and thus lead to the formulation of general laws.

Dr. Frölich, of Berlin, continues his researches as to the fluctuations of the solar heat, and he finds that the increase which was noticed during August last was accompanied by a notable diminution of the earth's magnetism.

The *American Druggist* tells us that a useful substitute for celluloid may be made as follows, and, moreover, the new preparation is not combustible. Dissolve 200 parts of caseine in 50 parts ammonia and 400 parts of water; then add 240 parts of quicklime, 150 of acetate of alumina, 50 of alum, 1,200 of plaster of Paris, and 100 of linseed oil. The ingredients are mixed by a rolling machine, and articles moulded of the paste are hardened by immersion in a bath composed of water 100 parts, gelatine 6 parts, and phosphoric acid 10 parts. Celluloid is an excellent material for making photographic dishes.

The English public are behind the French in appreciation of art. The Paris *Illustration* published last week a special number containing the principal pictures exhibited in the *Salon*. It is to be feared that a similar enterprize on the part of the *Graphic* or *Illustrated London News* would lack support, not only on the part of the public, but, strange to say, on the part of the artist. The whole of the pictures in the *Illustration* have been produced by photography, the paintings, of course, having been photographed before they left the studios. Over here artists, as a rule, show a singular disinclination to have their pictures photographed; but whether this arises from prejudice, or from some idea that a photograph would interfere with the engraver's province, is difficult to say. It is worthy of note, also, that the Meisenbach process, which has been used to produce the illustrations referred to, would not suit our English printing. On the highly glazed surface, never damped as is the case with our printing, and with the best quality of ink, the result is very satisfactory. These conditions appear at present to be unattainable in England. This is a pity, as photography in illustrated periodicals is in consequence heavily handicapped.

In a recent number of a German illustrated paper—the *Illustrirte Zeitung*—there is a notable instance of what the Meisenbach process is capable—a picture of the military manœuvres at Hamburg from an instantaneous photograph. In appearance, it much resembles Sprague's ink photos. The point worthy of attention is, however, that it has been printed in the ordinary way, and does not suffer by comparison with the engravings on wood in the same number.

The latest claimant to the honour of discovering photography in natural colours is an engraver at Versailles, who, according to the *Standard*, asserts that he is able to reproduce "the colours of the body or landscape photographed." The *Standard* refuses to believe this assertion, observing that "a photograph is practically a detailed shadow, and that a photograph could be taken which should preserve the green of the trees, the hue of the flowers, and the blue of the sky, together with the tints of dresses and such like matters, seems incredible." So it does; but could not the *Standard* have found a better definition of a photograph than a "detailed shadow?" Surely a picture in which only the parts actually illuminated, of course in varying degrees, is anything but a shadow.

Some time ago a correspondent of the *English Mechanic* wanted some information as to the possibility of taking instantaneous pictures from the window of a railway carriage travelling at twenty-five miles an hour. In commenting on the matter, we stated that most successful photographs of trains proceeding at a high rate of speed had been taken end on. This statement has surprised

another correspondent, who says the information is new to him. "After hearing," he remarks, "of horse-racing being photographically recorded; reading of the University boat race being thus pictured; seeing some wonderful account of a flying swallow being taken, and a shell from the 100-ton gun being so flashed off," he was little prepared "to find that such a prosaic subject as the broadside of an ordinary train had not even been decently done." We ought, perhaps, to add that M. Grassin's photograph of the "Nord" express taken near Boulogne is the best broadside picture we know; in it the steam is seen in a horizontal line above the train, distinct puffs marking the piston strokes for a distance equal to five coaches.

Mr. R. A. Proctor's statement—recently noted in these pages—that photography is of the highest value in connection with sun spots, received confirmation at the last meeting of the Liverpool Astronomical Society. A paper on "Sun Spots: their Birth and Changes," read by the Rev. S. J. Perry, F.R.S, was illustrated by ninety photographic transparencies; and, referring to the birth of sun spots, Mr. Perry expressed an opinion that sufficient attention had not been given to photographing faculæ and "rice grains," for by that means it was very probable the origin of sun spots might be traced. Mr. Perry paid a compliment to the Society when recommending it to turn its attention to solar photography, observing that if it met with the same success as it had done in stellar photography, its sun pictures would be second to none in the world.

If a portion of a gelatino-bromide plate is at a higher temperature than the rest during exposure, that part proves more sensitive than the remainder; while if a piece of ice be placed at the back of a plate so as to considerably cool a part of the film, and exposure be made, a patch of diminished density corresponding to the figure of the ice may be traced. These and other interesting observations are contributed by Captain Abney to the *Bulletin Belge*. That the characteristic properties of sensitive bromide, like those of phosphorescent compounds, should be exalted by heat up to a certain point, seems to afford some confirmation of Carey Lea's almost forgotten theory of actinism (see our vol. for 1867, p. 272). We shall probably say something more next week.

If we may judge by the opening ceremony at the Health Exhibition, less interest will be taken in this year's show than in that of 1883. The collection on view is a most miscellaneous one, most of the objects having only a remote or strained relation to the ostensible objects of the exhibiton. While the Duke of Cambridge was uttering somewhat stale platitudes about international exhibitions, the camera was at work; but as the light was not very bright, and the atmosphere inside the building was somewhat hazy, we are not sanguine as to the results.

"Blest be the art that can immortalise," said Cowper; only he spoke of painting, we believe, and not of photography. We came upon this quotation the other day in one of Dr. Holmes's works, and we came also on some other lines which are of interest in showing how we grow old in our portraits. From youth to manhood: "The artist takes a mean little brush, and draws three fine lines, diverging outwards from the eye over the temple. Five years.—The artist draws one tolerably distinct and two faint lines perpendicularly, between the eye-brows. Ten years.—The artist breaks up the contours round the mouth, so that they look a little as a hat does that has been sat upon and recovered itself, ready, as one would say, to crumple up again in the same creases on smiling." Quite a little lesson on retouching.

The *Archive* mentions an extraordinary period of darkness which, it says, affected London from Decembe 24th to January 5, and our Düsseldorf contemporary also states that during the whole of this period it was impossible to photograph by daylight, even with the most sensitive gelatine plates. We wonder that such a surprising phenomenon, extending over a period of more than a week, should have escaped our observation.

The *Daily Telegraph*, in referring to portraiture at the Academy, says:—"The modern portrait painter is on his mettle, and labours sedulously to do his best, as though he were aware that the Sun was among his sitters, taking notes, and that 'faith,' he would 'prent them.' Photography, so far from being the rival and the foe of the really good portraitist—it is true that it utterly slays the mediocre and the bad—is his counsellor and his friend. It shows him quite as many excellences to be imitated as defects to be avoided."

Mr. J. E. Taylor, of the Ipswich Museum, contributes to *Nature* an interesting account of a journey of observation he made in the track of the recent earthquake. It is much to be regretted that he did not take with him a portable camera and a stock of dry plates. The wonderful recording eye of the camera would, if it had been directed by Mr. Taylor, have placed on record an amount of detail calculated to throw much light on the subject. It appears that a few photographic illustrations of the earthquake have been secured, but no series exists having much scientific value.

A very interesting series of photographs is to be published by a firm at Pirna—the reproductions of all the portraits of the Popes in the "Chronologia Summorum Romanyium Pontificum," permission to copy which by photography has just been given by the Vatican. These portraits affect to go back to the earliest times, and if some are not genuine, there is no one to dispute their authenticity. The collection is, at all events, a valuable one.

The black cloud which recently passed over a part of Lancashire, and darkened certain neighbourhoods for about an hour, appears to have been caused by an accumulation of finely-divided carbon. The Rev. S. J. Perry,

of Stonyhurst Observatory, writes:—"At 11.30 the darkness was so great that it was found impossible to read even bold print (small pica) close by the window, and at this time a dense black cloud with a slightly yellowish tinge hung over the south-west sky; the blackness being most intense at 10° above the horizon. At 11.35 it became somewhat lighter, and at 11.40 the rain began to fall, and in forty minutes 0·114 inch of rain-water was collected in our rain-gauges, the whole being almost as black as ink, and full of fine carbon in suspension. Hail that fell a mile off to the south-west by south, and snow that fell on the hills two miles to the west, were also black.

Hydrogen is slowly liberated by the action of zinc on water, and it is consequently unsafe to store oxygen in gas-holders made of zinc. Löwe, however, states that if lime water is used in the gas-holder instead of ordinary water, no hydrogen is liberated.

Patent Intelligence.

Applications for Letters Patent.

7190. Jasper Wetter, Engineer, 67, Strand, Westminster, for "Improvements in the production of coloured engravings, photographs, and other images."—A communication to him from abroad by Lucien Forquignon, Bordeaux, France.—Dated 3rd May, 1884.

7191. Alfred Julius Boult, 323, High Holborn, Middlesex, Engineer, for "Improvements in rings for containing portraits or the like."—A communication to him from abroad by Emanuel Diamant, Budapest, Hungary.—(Complete specification.)—Dated 3rd May, 1884.

PHOTOGRAPHY IN MELBOURNE.

BY AN AMATEUR.

As a subscriber to your excellent journal, and a devoted admirer of the art and science of photography, I take the liberty of addressing a few notes to you from the Queen City of the South, and about which many people in England know and hear so little. It is the custom of many who have travelled a good deal to use the expression, "I have been round the world," who have never set foot in any of the Australian Colonies. Now, if the colonies are left out of a trip round the world, there is a great gap in the circle. But since the P. and O. Company and the Orient Company have laid on their splendid steamers and run them direct, travellers are turning their attention more to the colonies than formerly. New Zealand especially is very rich in scenery; the lake and mountain, I think, is not surpassed by any country in the world. I have no doubt you have seen examples of it, though a representative series of New Zealand views is as yet a thing of the future. There is a firm, I think, in Dunedin, who have turned out some very fair work.

Australia is not rich in mountain and lake scenery—that is, from a photographic stand-point; yet of virgin forest pictures there is an unlimited and really undeveloped field, though of such a nature that it requires judicious judgment in the selection of the point of view, and a skilful manipulation of the light, to make them meritorious as artistic productions. Some very fine studies have been turned out by one or two firms in Sydney and Melbourne Whole-plate is the general size for views in the colonies, and dry plates are almost exclusively used now; the days of collodion were numbered months ago.

There are a good many amateurs here, though nothing like in England. There is also an Amateur Photographic Association; the professional one, I believe, is defunct. Far advanced as the Colonies are, they are behindhand in photographic exhibitions, for I do not know of one ever being held in any one of them. It is to be hoped the day is not far off when they will be inaugurated, and perhaps a few English photographers will be persuaded to exhibit examples of their famous pictures, which must be really fine, judging by your excellent illustrations and glowing descriptions of them, which I read with great interest, and always regret when want of space cuts them short. By-the-way, it is a great pity that copies of these pictures do not find their way out here, for if it were not for your supplements we should have only a word description of them.

A great deal of rubbish is sent out here from England and the Continent as photographs of professional beauties, and plenty of mediocre landscape work. First-class work, such as you describe, we seldom see; and then it is only when it is in the possession of private individuals who have brought it out from home. It may be argued that it would not pay to ship good photographs of scenery out here, as there would not be a sufficient demand for it, on account of the supposed deficiency in taste of the colonials. I would like to know whether any firm at any time has tried the experiment? It comes expensive when one has to send home for copies of any particular pictures they may want; whereas, if they could be obtained here, the cost of postage, &c., would buy an extra print. In portraiture, the Colonies are not at all backward; excellent work is produced in all the principal towns, and some of the studios are fitted up very fine. Competition is very keen indeed—in fact, it could not be more so—and if a reputation is to be kept up, good work must do it. Unfortunately, the craze for the large over-retouched heads introduced by some American firms at the Sydney and Melbourne International Exhibitions has been taken up to a great extent, and has been sustained through some of the Americans establishing themselves here; but I do not think it will last. The public will fall back upon those firms who send out nothing but genuine work. It is only the vulgar in taste who are attracted by loud work, that exists at first by what eventually kills it.

THE GELATINE PROCESS.

BY WILLIAM BROOKS.

When travelling about in various parts of the country, as a rule I seldom pass a photographic studio without looking at the display of specimens exhibited in the window. I myself think that when the old wet collodion process was in full swing, the work generally was more even, but it matters not what process is used, or is the most fashionable, if I may so put it, muddles are always to be found in too great an abundance in almost every town. I allude to professional photographers. There are plenty who try to do everything they undertake to the best of their ability—and these are the ones who generally succeed in the end—and others are quite content to do things with the least possible trouble. I have at times come across many of the latter class, and sometimes I have suggested to them, when I have seen a fault, that they would get a better result if they did so and so, as the case might be, and at times I have had the reply, "Why, what's the use—people are satisfied, and why should I take any further bother about it? It pays me." And so long as this class of photographer can get an image at all, never mind if it is over or under-exposed, it is all the same.

I think since the introduction of gelatine plates, many more have been induced to go in for photography for a living than there were before.

Then there is another class of photographer who are always changing cameras and lenses, and always trying everybody's dry plates, and are satisfied with nothing, and

can never succeed, and try everything that is written almost. Their results, I need scarcely say, are anything but satisfactory.

There is another class who have the instantaneous craze; with them nothing is any good without it is instantaneous, as they call it. Their productions are generally under-exposed, and nothing done well.

Then there is the other class of photographer who are photographers in every sense of the word—who go steadily about their work, and succeed with almost any process. They will tell you, if asked, that the processes don't bother them much, and that they keep to one make of plate, and can generally get on very well. If one batch of plates does not work quite so well as the last, they only have, perhaps, to slightly alter either the developer or the exposure, as things are generally right, and on looking over the work it is generally to be found all that is needed as far as our general knowledge of photography has advanced.

Taking professional landscape photography, I think by a certain class there is far worse work done now than there was ten years since. I could not but notice, when in Oxford in the summer, the apologies for photographs that were being exhibited in some of the windows, and, say the least of them, they were abominable; intending to represent the different crews in their boats, they were simply indistinct, white patches on a black ground, and were labelled in large letters "Instantaneous." I have often wondered if such abominations ever find purchasers.

In the early days of gelatine plates, they were generally over-exposed; at the present time I may venture to say that many are spoiled by under-exposure. There has always been one weak point in the way of working gelatine plates, and that is, striving to bring them up with one development. I myself prefer to bring up the image, and not strive after density, and then intensify with pyro and silver. By my method it is a very simple matter, very easy, and without the slightest risk. After the plate has been well washed from the hypo, place it in a weak solution of alum and citric acid solution.

Stock Solution.

Saturated solution of alum	... 10 ounces
Citric acid...	... 1 ounce

For the solution above named, I dilute one part to four of water, allow the plate to remain in it about five or six minutes, in the meantime place in a developing cup about (say for a small plate) two drms. of the stock solution of alum and citric, and place in it about four grains of pyro; when dissolved, add a few drops of about a twent-grain nitrate of silver solution. Take the plate out and apply same as intensifying a wet plate; as the pyro changes colour, the colour will be imparted to the film, which is of no consequence. When sufficient density is obtained, well wash, and place in the hypo bath for a few minutes; well wash, and again place it in the alum and citric solution; dilute, to clear it. On examination, the character of sulphate will be found to have changed—it will have the appearance of an ordinary wet plate. The thinnest negative is amenable to this treatment. All this can be done in the daylight, It is best done before the negative has been allowed to dry.

RAPID *VERSUS* SLOW DEVELOPMENT.

BY E. BRIGHTMAN.*

The advocates of rapid development invariably object to slow development, first, on account of the extra time required, and secondly, on the ground that developing slowly causes a discolouration of the gelatine film. Now, as to the little extra time required, this surely should be no objection to the amateur, who works for the love of the art; a few minutes more or less spent on each picture certainly should form no objection. I readily admit that a very protracted development may cause slight discolouration, but cannot consider this as any serious drawback, because such discolouration may readily be removed by a short immersion in the alum and citric acid solution; moreover, the advantages of developing slowly are so great, that they would far outweigh the disadvantage of a slight staining of the film, even supposing such stain to be permanent and not removable.

A slow development undoubtedly gives a greater range of gradation between the high lights and deepest shadows, and as we have in nature an infinite number of gradations, it follows that a slow development will give a better and truer rendering of a subject than a rapid one.

In order to develop slowly, three courses are open to us: we may use a large proportion of bromide, or a small proportion of ammonia, or may add the ammonia gradually, adding it by successive small doses, until the desired amount of density and detail are obtained. This latter is the method I invariably adopt, and consider it gives by far the most satisfactory results, as it enables us to have entire control over the development, to avoid fog, and obtain brilliancy combined with delicacy and softness; and, most important of all, enables us to correct errors of exposure.

In the instructions issued by most manufacturers of gelatine plates, we are told to add certain quantities of pyro, bromide, and ammonia; then if the picture flashes out and shows signs of over-exposure, we are directed to apply more bromide, or, in other words, when the picture is half spoilt, we are to do what we can to prevent its total loss.

I cannot help thinking that this method of proceeding is totally wrong, as it is building up a picture on an imperfect foundation, for when once a trace of fog has made its appearance it is impossible to successfully carry the development further, without adding to the fog to a greater or less extent; but by slow development, even if a plate has been exposed five times longer than necessary, it is possible to produce a negative without the slightest trace of fog, and, moreover, without any loss of brilliancy, and in fact equal in every respect to one which has received only the normal exposure.

Now, as an ounce of practice is worth a pound of theory, I propose to expose three plates under a transparency, to one of which I will give 5 seconds' exposure, to the second 50 seconds, and to the third 100 seconds, or 10 and 20 times the correct exposure.

I can admit that for the professional photographer, working in the study with the light under control, he may so accurately time his exposures that there may be no necessity for such careful and cautious development; but with amateurs who, like myself, practise upon all classes of subjects, under all conditions of light, errors of exposure must occur; but if we observe the rule of always giving a full exposure, and developing slowly, not a single plate should be lost.

In addition to the absolute certainty of thus working, the results obtained are certainly superior to those by rapid development, having the pluck and brilliancy characteristic of a good wet plate.

Next as to formula for developer. I usually keep two stock solutions.

No. 1

Pyrogallic acid	... 1 oz.
Bromide of ammonium	... ½ oz.
Citric acid	... 80 grains
Water	... 8 ozs.

No. 2

Ammonia	... 1 oz.
Water	... 7 ozs.

To develop a half plate, take 4 ounces of water to which is added 1 dram of No. 1; immerse the plate in this solution, and allow it to soak for a moment or two. Next measure out one dram of the No. 2 solution, one fourth or quarter dram of which is poured into a measure and mixed with the pyro solution, in which the plate has been soaking; this solution is again poured upon the plate, and if sufficiently exposed, the higher lights will slowly appear, but without much density; a second quarter drachm of ammonia is next added as before; with this addition the more brilliant half tones will make their appearance, and the higher lights gain a little additional density. The third quarter drachm of ammonia is then added, when the details and faint half tones will gain in force; the remaining portion of ammonia being added, the faintest half tones will be brought out and the high lights have gained the full density; the resulting picture being,

* Read before the Bristol and West of England Photographic Association.

as far as development is concerned, all that could be desired. In the event of considerable over-exposure, the first or second addition of ammonia may be sufficient to fully develop the picture, and give full density, in which case, of course, no further addition should be made.

I do not attach any importance to the formula I have given. Any good standard formula may be used, but the one great point of importance is to commence with a small portion of the ammonia, adding it by successive small doses until the desired result is obtained.

DRYING PLATES WITH CALCIUM CHLORIDE.

BY THOMAS S. HAMILTON.

I AM ashamed of the naughty words I used formerly when engaged drying my emulsion plates, and afterwards in the development of them. Every method as published I have tried, with—I have to confess—indifferent success, for I seldom escaped without markings and spots on the films, due to a variety of causes that, I have no doubt, can be summed up in the word—"carelessness!" But humanity seeks not to be troubled with care, and a little latitude is "so delightful!"

The dried air current being my bugbear—for all those nasty things it did—I determined to do without it. To that effect I stopped up the inlet and outlet of my drying-box, making it as air-tight as possible, and distributed in six deep saucers four pounds of calcium chloride, placing one on each alternate end of the shelves, after which the plates were put in, and the box closed. The plates were dry in sometime less than forty-eight hours; and two more batches of fifteen whole-plates each were dried without touching the calcium, nor was it taken from the box until required for duty again, when it was turned out of the saucers into a drying-pan—a frying-pan—to evaporate slowly over the hot plate of the kitchen-range, and replaced in the unwashed saucers when on the point of crystallizing.

Chrome alum was used in the emulsion in the proportion recommended by Captain Abney in his "Photography with Emulsions."

This method of drying is simple—for any box that is air-tight can be used, and it is a certainty—for the plates are uniform and clean to the edges. For the past six months I have dried in this manner without a failure, and I will never again ruffle my temper in the attempt to dry air that will not dry plates half so well as act the carrier for every abomination that our too industrious "Biddy" insists on driving under the door and through the key-hole of my dark-room with that spasmodic broom of hers.

LECTURE ON THE COMPOSITION OF A PICTURE.

BY NORMAN MACBETH, R.S.A.*

HAVING occasion to be in London every year seeing the Royal Academy and other Exhibitions, I thought of paying a visit to this Society, and seeing that I had been honoured with the confidence you had reposed in me—adjudging the selected works of the year—I had the desire of having a friendly conference, and submitting for your consideration a few of the leading principles which operated in forming my judgment, and which might be deemed useful for further prosecution of such art studies. Consequently, I made the offer through your esteemed Secretary, and it was accepted.

He had, I noticed, led you to understand that I was to read a paper on the subject of "Composition of a Picture," but beyond a few introductory remarks, I prefer, from a few diagrams which formed the subject matter of some old lectures, to make a selection from them, and adapt them to our present circumstances, explaining them simply in a verbal manner. Having had some of the topics presented in the journals of photography last year, in a paper entitled "An Early Taste for Art," I have no wish that what I now give be repeated in print.

* Preparatory remarks to a discourse delivered before the South London Photographic Society (see page 301).

Before proceeding to my exposition, permit me to congratulate this Society on the very laudable effort you are now making in the direction of the art study of composition.

The pictorial is certainly an outcome of practical efforts in photography. Lately, when I was asked by the Edinburgh Photographic Club to make a design for their diploma, I represented photography in the character of a maiden as the daughter of Nature, Science, and Art. In the two former she has hitherto had great demands for her assistance, and now, by her extremely ready service in instantaneous work, she is becoming a meet help for the wants of fine art. But higher still than being an auxiliary, to her credit she is now displaying how successfully the principles and theory of art may be demonstrated. I need not refer to any higher than the composition and aerial perspective of the work which lately received the first award of this Society.

I trust that other societies will follow the example, and that conversaziones on art topics will occupy in the future as much attention as chemistry has done in the past.

In the early history of photography a transcript of any object caught up by the camera was such a marvel, one was satisfied with any production provided it was perfect in development but such has ceased to be curious, and far less to satisfy. A merely photographic transcript, however perfect in itself, does not constitute a picture. There must be a specific purpose, an object of some meaning aimed at, having a principal point constituting the main feature of the theme, and the subordinates following with their respective values.

The composition of a picture embraces, and is manifested in, form, light and shade, and colour. The latter, colour, you have nothing to do with, but by representation in tone. A putting or placing of them together in their respective values, in combination with varied treatment, constitutes the perfection of composition, and all the more when accompanied with great invention and originality. It is not to be expected that photography will ever rival the painter's manipulative skill in subordinating accessories, but it will go further in realism, if that be an object, and it is quite capable in the hands of an artist to show how a complete grasp of the spirit and theory of art may be fulfilled; but until this is clearly enunciated, it will hold but a very second place in the department of fine art.

Correspondence.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

SIR,—Will you please allow me a few lines to inform intending contributors to the "Statham Testimonial Fund" that the subscription list will be closed to-morrow (Saturday), May 10.—Yours truly, F. A. BRIDGE.

Hon. Secretary and Treasurer.

9, *Norfolk Road, Dalston Lane, London.*

THE PROPOSED AMALGAMATION OF THE LONDON PHOTOGRAPHIC ASSOCIATIONS.

SIR,—Does Mr. Cobb seriously believe it is possible for there ever to be an amalgamation of Metropolitan Societies, Associations, and Clubs? It is unwise to prophesy unless one knows, but of all the unlikely things I should suppose possible would be the amalgamation proposed in Mr. Cobb's letter. Still, it must be conceded that, as matters stand at present, there is undoubtedly a great waste of energy and needless expense in the maintenance of some three or four societies where one might serve. A glance at the YEAR-BOOK shows that in the three societies named there are no less than fifty-three officers, viz.—

The Photographic Society	25
The South London	16
The Photographic Club	12
	53

This does not include the newer London and Provincial Society, in which there are some four or five officers, and in which every member is on the Committee; nor does it include the Amateur Field Club. It is true that in the

three societies named there are gentlemen holding office in all of them, yet fifty-three individuals might be office-bearers; whereas, if amalgamated, one dozen would suffice. Probably the more serious objection is, that there are three separate rents and expenses, representing a waste of revenue quite sufficient to maintain a house all its own.

The real key-note of Mr. Cobb's letter seems to be that there are too many Metropolitan Societies; and if that is his meaning, I readily agree with him.—I remain, yours, &c.,

A Member of them All.

Proceedings of Societies.

South London Photographic Society.

The ordinary meeting of this Society was held on Thursday, the 1st inst., at the House of the Society of Arts, John Street, Adelphi, W.C., Edwin Cocking, Esq., Vice-President, in the chair.

The Chairman: It is my most painful duty to take the chair at this first meeting of the Society after the lamented death of our President, whose loss we must all so deeply deplore. For twenty-five years this Society has existed under one President, and during those long years we have not only entertained feelings of deep respect for him, but I may say love. I think it will be admitted that that feeling arose from one great characteristic of our late President, which was that of genial, warm-hearted sympathy. He was a man who was animated with the spirit of kindness which smoothed down angularities, and brought to light the latent good which was in everyone; after listening to his remarks we felt the tone of our minds elevated, and besides the brighter view of things which his words inspired, we felt grateful, and our hearts warmed towards the man who, with such unflagging interest, had presided over this Society from its first formation.

Mr. F. A. Bridge: It was thought before this meeting commenced, that a formal letter of condolence should be drawn up and sent to the family of our late President, whose loss has been such a great blow to this Society; had this been done, as a matter of strict etiquette a chairman would have been appointed, the minutes read, and the meeting adjourned. Our late President's first idea was duty; the best way we can do our duty towards him is by carrying on the work of the Society in which he took such an interest. Mr. Bridge then read an extract from the *South London Press*, which he considered a fair estimate of the general esteem in which their President was held. They all desired to be proposers of this letter of condolence, so he would ask the meeting to arise in mass, and an informal letter of condolence would be sent to the family.

The members again having taken their seats, the minutes of the previous meeting were read and confirmed.

The Treasurer said that the Society was represented at the funeral by a great many members; a wreath was also sent by the Society, which he photographed, a copy of which could be seen.

The Chairman then called upon Mr. Norman Macbeth, R.S.A., to deliver his promised lecture on "Composition" (see p. 300).

Mr. Macbeth, after alluding sympathetically to the memory of the late President, said a great portion of the matter he intended bringing before them would be of a desultory character, leaving himself open to questions which might arise in the course of his speaking, rather than simply confining himself to writing, and thus more information be contributed. Continuing, he divided his subject into seven different topics, viz.—1st, the field of view, its boundaries; 2nd, Landscape work; 3rd, Sea views; 4th, Mountainous views; 5th, Sky effects and arrangement; 6th, Figure subjects; 7th, Portraits.

In reference to field of view Mr. Macbeth said: Given any space, exercises the mind to fill it, and the artist's power to make manifest his own individuality. Every man has a distinct way of treating a subject, and makes a proper field in which to define his ideas. The thought may never have passed through one's mind why pictures are oblong, not square. The square shape was then illustrated, also the diagonal of the square of breadth of picture shown to form the most suitable measurement for the length of base-line of it. The lecturer then proceeded by saying that either longitudinal or vertical fields of such proportions and relationship must produce variety. When properly filled, square proportions would be too finely balanced. The question then arises, on what principle is it to be filled? All cameras should be made as much as possible of the oblong shape proportioned to the length, being the diagonal of the square of the breadth.

Dividing the field.—Divide an oblong into three equal divisions by three longitudinally, the points where these lines intersect constitute the principal points of choice in the picture. The principle is founded on the mathematical ratio of odd numbers; when even numbers, such as two, four, six, eight are employed, the same difficulties would be met with as in the square form—the parts would be too finely balanced, an illustration of this being shown. The lecturer, continuing, said, take care to keep the principal object as much as possible out of the centre, as it is always more forcible towards either side than it would be if it were in the middle of the picture. Divide the focussing glass of the camera into three or five, these being the simplest subdivisions. Looking at nature over these, some characteristic points will be sure to light on one of these intersections. Seven divisions may be made, but they are more confusing. Subdividing them by even numbers would constitute weak parts. Howard's "Sketcher's Manual," now out of print, is the best work Mr. Macbeth knew in which these principles were very fully enunciated.

Landscape.—The first thing when in the field is to determine the base-line of picture desired. The landscape painter begins his subject at a fixed distance from where he stands; this base-line should not be less than twelve paces or thirty-six feet from the position of drawing the scene. When the camera is raised to meet the eye, either standing or sitting, if dead level, the base-line is not likely to be too near. Many landscape photographers dip the camera to get more foreground than is desirable, thus straining those portions of the foreground out of their due proportions. Supposing the camera is placed twelve paces from a fixed point, and marked by some object such as a handkerchief, let six places be taken on each side of this; that span forms an angle of 60°, and constitutes the base-line of the picture; this prevents getting too near, and defines the extent of view. Some think that the centre of view is the centre of picture; but that is very often, and most desirably, kept to either side, with the intention of being on some strong intersected point; neither should the two sides in balance be alike, as in photographing a street view one should always preponderate over the other—*i.e.*, be more seen.

An illustration of the vanishing points was then shown, and the manner in which these ran out of a picture explained.

Overcharging the foreground was next spoken of, a diagram showing three sizes of picture taken with an instrument, and the errors seen in photographs taken with wide-angle lenses exemplified the radius of the human eye being a desirable field. Speaking on the importance of the horizontal, according to the subject, so the position of the horizontal line must be placed either towards the top or bottom. Where everything is flat, the horizontal line is placed low, affording space for clouds.

In photographing mountainous districts it is recommended to have the line near the top, thus allowing space for ravines, valleys, &c. There is not anything more important in the case of rendering hills, than keeping the principal light on either side of the picture and running diagonally.

In taking sea views, the horizontal line being low, allows space for clouds, which are often very beautiful in composition when taken on the same plate; but being made parallel with the base, should be avoided, especially where mountains are distant. Great value may be imparted by getting opposing lines of clouds in the composition. The skies may be secured on separate negatives, combination or double printing being resorted to. The sky shade of Mr. Parker (page 710 of our last volume) is invaluable for coast scenes when the horizontal line is low, the lecturer having succeeded in getting some very good results in the evening, when it was necessary to give a long exposure to the foreground, the sky all the time being shielded. The afternoon is the best period for making sky pictures.

Figure Subjects.—The best book on composition, the lecturer said, was by Burnett, the celebrated engraver of Wilkie's works. No books he had met with were so complete and reliable in giving information on the education of the eye, a proper appreciation of light, shade, and colour in its treatment, as these. The study of the Dutch pictures was recommended, particularly Teniers and Ostade were mentioned. A careful study of Mr. Robinson's new work should also receive special attention. The composition in Wilkie's works was next instanced, also Raffael's

cartoons. Speaking of "The Blind Man at the Beautiful Gate of the Temple," he said each of the pillars there formed fine intersections, and were beautifully filled by forms in the shape of a cross. In all cases it is necessary to guard against repeating in exact balance, an important point on the other side of a picture. By keeping this in mind, and the intersection by odd numbers, photographers would be sure of getting variety. In visiting the French Exhibition, these principles were well carried out in pictures there. Some of these painters may never have known these rules, but have been guided according to them through following the works of others. From exhibitions we see many artists, not knowing these methods, or ignoring such teaching, run into many errors.

Speaking of portraits, the lecturer noticed there was a tendency to place the head too near the centre of the picture. A good rule is to let the space from the hair to the top of the picture be one-quarter the length of the head for an English head size, 25 by 20; the next size, 30 by 25, let the distance be double, that is, half a head; kitcat, 28 by 36, three-quarters of the head; and 50 by 45, a full head. He should have said something about the composition of the works of Vandyke, Rembrandt, Turner, Rubens, Velasques, Reynolds, Millais, and others, but time would not permit. A man should be regulated by his own ideas and feelings, so long as these do not altogether violate such simple guides; the recognition of such principles as now laid before them would be ample; they would be able to produce immense variety in form and general interest. A large number of examples from engravings were then shown, illustrating where these rules had been observed, and where they had been disregarded.

The subject being closed, several members put questions, which Mr. Macbeth answered, in so far as they related to the subject. In reply to Mr. Downes, Mr. Macbeth stated that everything depended in carrying out the proper length at which the subject was to be viewed, and photographed, on length of focus of lens, and length of accommodation in studios; he strongly deprecated wide-angle lenses to meet limited spaces. By whatever means employed, there should never be over-straining the lens, and so producing false effects. His own studio for painting was 35 feet long, 25 broad, and 22 feet high. He could never feel the true aspect of his sitter without such accommodation. As to Mr. J. Traill Taylor's question regarding the base-line of a full-length portrait, Mr. Macbeth recommended it to be low, to guard against the tendency of overloading the field with too much furniture, and the appearance (unless you represented a very distant view of the field of picture) of making the floor and accessories on the table all tumbling or sliding down. A very distant view, and the horizontal line low, gave great dignity to the whole arrangement. The painter, in contra-distinction from the photographer, views his subjects from many levels, the latter from only one point. Hence the necessity of being far from his sitter.

The Chairman, in moving a vote of thanks to the lecturer, said he hoped societies in the future would induce artists like Mr. Macbeth to accompany them into the field, where they might get the advantage of practical illustration of the principles set forth.

The vote being accorded, Mr. Macbeth said no jealousy existed between himself and photographers; each were only studying facts, and the great object of each is, who will make the most of them. Many most excellent artists fully appreciated photography, and took advantage of any assistance a photograph could give them. He should be exceedingly glad to come again to this Society.

The Chairman announced the presence of a distinguished visitor, Mr. Pancoast, late Secretary of the Photographic Society of Philadelphia, who was accorded a warm greeting.

Mr. Pancoast said he had just returned from a tour in India, visiting the Calcutta Exhibition *en route*. At no time in the history of India had such a magnificent collection of fine arts been brought together as on this occasion. Many of the exhibits he photographed, and would send them some prints as a token of his appreciation of the Society.

The Chairman announced that the subscription list for a suitable memorial to the late president would close on May 10th. The next meeting of the Society will take place June 5th.

London and Provincial Photographic Association.

The usual weekly meeting of the members was held at Mason's Hall Tavern on Thursday, the 1st inst., Mr. W. E. Debenham in the chair.

Mr. J. Barker, in reference to the discussion of previous week on definition, showed a print from a negative taken with a common French portrait lens of 4¼-inch back focus with full aperture.

The Chairman did not consider a print was sufficient evidence in itself of a power of a lens; it should be compared under precisely similar circumstances with a well-known and tested lens.

Mr. J. Cadett, refering to diffraction, remarked that Professor Stokes had said: "If the diaphragm is placed exactly at the optical centre, no diffraction can take place, however small the aperture of the diaphragm."

Mr. F. G. Hart showed a simple way of locally removing matt varnish to increase printing power. Having coated a sheet of glass with matt varnish, and dried it, he passed it over an uncorked bottle of ether; those parts of the glass plate that had been exposed to the vapour were reudered quite transparent. This plan has the advantage of leaving perfectly soft printing edges.

Bristol and West of England Amateur Photographic Association.

The ordinary monthly meeting was held at the Association's Studio on Wednesday, 23rd inst., Colonel Playfair, Vice-President, in the chair.

After the usual preliminaries,

The Chairman called upon Mr. E. Brightman to read his paper on "Slow *versus* Quick Development" (see page 299).

The Chairman said that Mr. Brightman, having exposed two plates of similar sensitiveness, one for eight seconds, and the other for eighty seconds, and developed both with successful results, had demonstrated that, so far as these experiments were concerned, slow development possessed decided advantages. He should like to have seen compared the development of two negatives correctly exposed, one by slow, and the other by quicker, development.

Mr. Brightman said that he should very probably bring such examples at a future meeting, and he thought the results would prove the superiority of the former mode.

The Chairman asked Mr. Brightman if he followed exactly the same practice with regard to under-exposed negatives?

Mr. Brightman replied that he did exactly, always using the same quantity of pyro.

The Chairman said that that appeared to him to quite oppose the usually accepted law.

Mr. Daniel said that probably the effect produced was that of obtaining full detail at an earlier stage of the development, so that such detail was really worked up before the pyro was sufficiently acted upon by the ammonia to produce much density in the high-lights.

Mr. Tribe had generally considered that in developing an under-exposed negative, it was desirable to lessen the amount of pyro.

After some further discussion, the next and first excursion meeting of the session was fixed for Saturday, 17th May.

A cordial vote of thanks, on the motion of the Chairman, was unanimously passed to Mr. Brightman for his interesting paper.

Dundee and East of Scotland Photographic Association.

The eighth and last monthly meeting for the session was held in Lamb's Hotel on Thursday, 1st inst., Mr. J. Geddes presiding.

After the routine business had been disposed of,

Mr. Jno. Robertson read a paper on "Dark-room Illumination." Until lately he had scrupulously obeyed the injunctions accompanying dry plates, and had worked in ruby light. As the result of some experiments, however, he had entirely discarded ruby, and fitted up his dark-room windows with two thicknesses of cathedral glass with a double sheet of orange tissue between. The illumination of his dark-room was now all that could be desired, and he had never enjoyed such a perfect immunity from fog, as, since the adoption of this light, the result was so satisfactory that he was fitting up the same light in his coating-room. A hearty vote of thanks was awarded to Mr. Robertson.

One new member was admitted.

Mr. Walker kindly sent a collection of prints taken about 1856, which excited much interest, and the fact that in very few of them were signs of fading to be detected, testified to the carefulness of the manipulation.

On the motion of the Chairman a vote of thanks was passed to Mr. Walker.

Glasgow Photographic Association.

The annual business meeting of the session was held in the Religious Institution Rooms on Thursday, 24th ult., Councillor Robertson presiding.

The minutes of last meeting were read and confirmed.

The office-bearers for the ensuing session were then elected, and were as follows :—

President—Councillor Robertson.
Vice-Presidents—Messrs. Robert Dodd and John Parker.
Treasurer—Mr. G. Bell.
Interim Secretary—Mr. J. Craig Annan.
Council—Messrs. J. Craig Annan, W. Laug, Juu., Geo. Mason, James McGhie, J. Y. M. McLellan, and Mr. J. M. Skinner.

An outdoor meeting was then arranged for, and Cadzow Forest (the home of the Duke of Hamilton's famous white castle) was suggested as the place, and 6th of June as the date. The arranging of the details was left to the Council and Mr. Falconer.

Some business of a private nature followed, and at the close of the meeting

Mr. Falconer showed a number of very good magic-lantern and stereoscopic transparencies, and also a sky-shade. This was something like the upper half of a diaphragm, and was composed of slips of card, which could be pushed up or down to the approximate shape of the sky-line. This was inserted on a slip in the front of the lens during the greater part of the exposure, and removed just before replacing the cap.

The meeting closed with the customary votes of thanks.

Talk in the Studio.

Photographic Society of Great Britain.—The next ordinary meeting of this Society will take place on Tuesday next, May 13th, at eight o'clock, p.m., at 5A, Pall Mall East (the summer exhibition of the Royal Society of Painters in Water-Colours being on view), when papers will be read, on "Observations on Fading," by John Spiller, F.C.S.; "Illumination of the Dark-Room," by W. E. Debenham; and "Commercial Fabrics Suitable for Dark-Room Illumination," by J. R. Sawyer.

The Copyright Act.—Mr. Sheil heard ten summonses which had been taken out by Mr. H. W. Taunt, photographer, of Oxford, under the Copyright Act, against Canon Erskine Clarke, the registered proprietor of *Church Bells*, for publishing a colourable imitation of a photograph, his property. Mr. Dudley, of Oxford, appeared for the complainant, and Mr. Turner for Canon Clarke. It was stated by Mr. Dudley that it was a photograph of St. Nicholas Church, Newbury. Mr. Turner admitted that the illustration was taken from the photograph, but he submitted that it was not a copy, nor a colourable imitation, as provided by the Act. Canon Clarke had no desire to infringe the Copyright Act. The photograph was sent by a gentleman from Newbury, with a request to publish it. Mr. Sheil dismissed all the summonses, and granted the compiainant a case for the opinion of a superior court.

A Question of Ancient Lights.—In the case of Parker *v.* The First Avenue Hotel Company, heard in the Queen's Bench on Wednesday, the plaintiff had for many years carried on the business of a photographer at 30, High Holborn, which is at the corner of Warwick Court, and his studio is at the top of the house. The First Avenue Hotel was built on the west side of the plaintiff's premises, and there had been a good deal of litigation in reference to the obstructiou of the plaintiff's light. Mr. Justice North granted an injunction to restrain the defendants from carrying on their building operations except in a particular way; and this order was afterwards modified in the Court of Appeal. The present application was that a sequestration should issue in consequence of this injunction not having been obeyed. Mr. Finlay, Q.C., and Mr. Colt were for the plaintiff; and Mr. H. Matthews, Q.C., and Mr. Bedall for the defendants. The proceedings were for the most part of a technical and an uninteresting character. But in the end, counsel, acting upon a suggestion from the Bench, came to an arrangement by which it was said that all further litigation would be put an end to. It was mentioned that there were two actions pending, and also an appeal to the House of Lords in one of them.

The Photographic Co-operative Stores.—We understand that the business of the Photographic Artists' Co-operative Supply Association, Limited, has changed hands, and that a new Company has been formed to carry on the concern. Messrs. Arthur H. Laing, A. F. Charrington, and W. B. Whittingham are mentioned as being on the Board of Directors. Mr. H. R. Faulkner, who has been connected with the business for upwards of five years, has been appointed manager and secretary.

Death of Mr. F. A. Wenderoth, of Philadelphia.—This veteran photographer and artist died on the 15th of March, his age being sixty years. He was a native of the Hesse-Cassel, but removed to Philadelphia in 1857.

Magnesium.—At the close of the last meeting of the Berlin Physical Society, Dr. Frölich handed round a large lump of magnesium as the product of an electrolytic industry. The piece was wrought in a factory according to a patented method based essentially on the melting of chloride of magnesium, and decomposing it in the melted state by an electric current.

Lecture Experiments on the Actinic Action of Light.—By V. Meyer (*Ber.*, 16, 2998—3001).—For the purpose of showing the action of light on an explosive mixture of chlorine and hydrogen, the author fills jars 25 cm. high and 35 mm. wide with the mixture, and closes them with paper covers; one is left colourless, and others coloured violet and yellow by means of spirit varnish and aniline colours. On igniting a large quantity of magnesium-dust in a Bunsen burner, the gas in the colourless and violet jars instantly explodes, but that in the yellow jar does not, and may be fired with a burning chip. A fourth colourless jar may be kept to show photo-chemical induction, for whilst with sufficient magnesium-dust the explosion takes place instantly, on exposing the mixture to burning magnesium wire, several seconds elapse before the gases combine.—*Journal of the Chemical Society.*

Cantor Lectures on Optical Instruments.—Mr. Norman Lockyer has just delivered a short course of lectures at the Society of Arts, on "Some New Optical Instruments and Arrangements." The course commenced by a discussion of some points in connection with astronomical telescopes, while in the second lecture he laid great stress upon the want of proper arrangements for the manufacture of optical glass. The great want for instruments, such as those described in the last lecture, was a mirror of sufficient size; and if it were possible to cast a disc of glass of eight feet diameter, and of the necessary thickness (which would be for a dise of that size about one foot) there was no difficulty whatever in silvering the surface. He then proceeded to give some account of the progress which had been made in photographing celestial objects, by Mons. Janssen in photographing the sun, by Mr. Huggins in obtaining photographs of spectra of the stars, and by Mr. Common in obtaining photographs of the nebulæ themselves. He exhibited and described the instantaneous shutter arrangement used by Mons. Janssen. In the case of the long exposure, rendered necessary by the faintness of the light of the stars, the motion of the clock proved not to be sufficiently accurate to keep the image of the star always in the same position on the photographic plate, and it was necessary for the observer, by means of apparatus which Mr. Lockyer described, continually to regulate the position of the photographic plate by hand. Mr. Lockyer pointed out the importance of these photographic observations, which were not influenced by the idiosyncrasy of the observer, and which possessed the advantage of dealing with larger portions of the heavens, and more rapidly than the observer's eye. He expressed the view that it was now a waste of time to employ the eye in astronomical observations, and sketched an instrument having an aperture of eight feet, and costing only half the price of the domes now being built in Paris, by which photographic plates exposed by electro-magnets should be alone employed. By this means a complete reference library of the heavens at the present epoch could be secured for the benefit of those who come after us, giving forms of nebulæ and clusters, photometer star maps, double stars, and stellar and nebular spectra.

Gelatine.—By H. Weiske (*Bied. Centr.*, 1883, 673).—The author has prepared gelatine in various ways, and has found that the products differ in properties. Pieces of bone were treated repeatedly and for a long time with dilute hydrochloric acid to remove the inorganic matter as completely as possible; they were then washed. Gelatine made from this is not precipitated from its solutions by tannic acid unless a few drops of a solution of a salt (sodium chloride, &c.) are added simultaneously; in other respects it does not differ from ordinary gelatine. By boiling bones

free from mineral matter with repeated quantities of water, and then dissolving the residue by heating with water under pressure, two solutions are obtained which, when evaporated to dryness at 100°, yield two kinds of gelatine differing from one another, and also from the above variety in various properties.—*Journal of the Chemical Society.*

PHOTOGRAPHIC CLUB.—At the next meeting, on May 14th, the subject for discussion will be on "Developing with and without Sulphite of Soda."

To Correspondents.

*** We cannot undertake to return rejected communications.

J. H. B.—As the negatives are larger than the required slides, you must perforce copy them on a reduced scale by means of the camera. As any method by which negatives can be produced in the camera will serve for the making of lantern transparencies, it is difficult for us to give you useful advice unless we know what you can do; but if you are specially experienced in any one negative process, you had better adopt that. Very fine results—perhaps, indeed, the best of all—can be obtained by the wet collodion process when it is in the hands of a skilled manipulator. A series of articles on lantern slides was commenced on page 129 of the last volume of the NEWS.

H. SPINK.—We have not yet got the information you require, but will communicate with you by post should we be successful.

J. M.—We have every reason to believe that the markings arise from the presence of a trace of greasy matter in the gelatine, and this seems to exist mainly on the surface of the original flakes. In similar cases we have found it to be an advantage to wash the gelatine in ether before dissolving it.

A. G. B.—1. Your query appeared on page 286 last week, and we hope to have Dr. Eder's opinion on the subject. 2. We have not seen the pictures, but should like to have further particulars. 3. Ths firm is an old-established and respectable one, and has been carrying on the same business for about twenty years. We are altogether unable to account for your experience, but will write to them. 4. Each component will make an excellent single lens, but you will find that their foci are not identical, except in the case of some of the older instruments. If you use the front combination, with the stop behind, the distortion will be of the pincushion kind; but it is perhaps more convenient to use the back combination, as the tube forms a sky-shade. In any case, cover the bright brass screw with a ring of black paper. 5. We can hardly recommend its use unless circumstances render thorough washing impracticable. If any lead remains in the prints, they are liable to blacken if exposed to an impure atmosphere. 6. Probably you did not wash away the hyposulphite of soda completely, and, as the film dried, the image became partially dissolved. 7. It may be used to replace the distilled water, but we would recommend you not to use it unless circumstances render it unavoidable.

W. E. W.—We should strongly advise you not to enter into the transaction unless the person is well known to yourself, or you have the written consent of the publisher to copy the engravings. We know of a case in which a paid informer called on a photographer with a similar story, and afterwards extorted a considerable sum by threatening to prosecute for piracy.

F. W. B.—1. We cannot judge well without seeing examples, but should think it likely that the first mentioned defect arises from irregularity in the drying, perhaps caused by opening the door of the drying cupboard; and the second from pimples or defects on the glass plates. 2. No harm will result as long as the acid does not come in contact with the plates.

WILLIAM LANG.—1. We believe it has not been translated at full length, but nearly the whole is comprised in an abstracted translation, which was commenced on page 172 of our volume for 1878, and runs through this volume and that for 1879. 2. We believe that the method has been worked very successfully under the direction of M. Leon Vidal himself.

L. T. HAAKMAN.—1. You are quite right—the inlet should be the larger of the two. 2. We think it will be quite necessary to warm the upshot pipe, as otherwise you could not depend on a constant circulation of air taking place. 3. Thank you; we shall be very pleased to have particulars.

GIULIO ROSSI.—1. Traces of greasy matter in the emulsion (see answer to J. M). 2. We think they are due to a disintegration of the surface, arising from the circumstance already referred to.

QUI BONO.—You can hardly expect us to assist you in selling them, but if your work is good, you should have no difficulty in finding a market for them in the town where you reside. If you wish to work for the photographic profession, you cannot do better than to advertise.

R. T.—"*Trockenplatten*" would be the equivalent of the English "dry plates," but this expression does not in any way correspond with the French "*Clichés Photographiques*," as by cliché one understands the original from which copies are produced, whether this original be a negative or a positive. There is no precisely equivalent expression in English or German, and, as a consequence the term cliché is frequently imported into these languages.

R. S.—We believe that twenty-one years is required in ordinary cases, but you should consult a solicitor.

A CONSTANT READER.—It is a trade secret of some value, so we imagine it would be of no use for you to make an enquiry of the firm interested in the matter.

SOUTH DEVON.—Any maker of photographic apparatus will construct it from the designs which have appeared in the PHOTOGRAPHIC NEWS.

W. G. CLEMENT.—1. We do not think there are any commercial plates which can be depended on in this respect. Indeed, if you could devise a means of making such plates as you require, you would confer a benefit on the photographic fraternity. 2. You should try the combination of orange glass and ground glass recommended on page 50.

J. E. H.—1. We recommend you not to use a preparation of unknown composition for the purpose. 2. It has been done long since by Mr. Woodbury and others.

ALPHA.—1. The best series we know of consists of the "Photographic Handy Books," published by Piper and Carter. No. V., Mr. Robinson's "Picture Making by Photography," has just been issued. 2. Certainly you can if the lens is a good one.

J. H.—(Plymouth).—Write to Dr. Pick, of 38, Queen's Road, St. John's Wood.

Price 6d., by post 6½d.

A TRIP TO THE GREAT SAHARA WITH A CAMERA. BY A COCKNEY. Being an Account of a Month's Winter Holiday, with Diary of Journey and Statement of Expenses.—PIPER & CARTER, PHOTOGRAPHIC NEWS Office, 5, Castle Street, Holborn, E.C.

The Photographic News Registry.

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Op. & Ret. £3 3s. weekly.—W. H. H., 29, Black Lion-la., Hammersmith.
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Retoucher, 25s. weekly.—Miss H., c/o Mr. Kent, 49, Newman-st., W.C.
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Reception-Room in first-class house.—Sophy, *Photo. News* Office.
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Retoucher (specimens).—Elliot & Fry, 55, Baker-st., W.
General Assistant, to retouch, finish, &c.—T. Price, Jersey
Printer, Toner, Vignetter, &c.—T. Moss, 199, Derby-st., Bolton.
Person to Mount and Spot Cards, &c.—Lafosse, Knolls House, Manchester.
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Gentleman of experience, for City warehouse.—H., *Photo. News* Office.
Printer, perm. to good man.—Benedetti, adjoining Peckham Station.

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Henry Baden Pritchard.

IT is with deep regret that we have to announce the death of Mr. Henry Baden Pritchard, whose name has been so long and intimately connected not only with the PHOTOGRAPHIC NEWS, but with the photographic world in general. He had been ill for a week or ten days with an attack of pneumonia, but was progressing very favourably, when on Sunday evening last, the 11th May, he was seized with faintness, and died almost immediately.

Mr. H. B. Pritchard was the third son of the late Mr. Andrew Pritchard, the eminent microscopist, and author of the "History of Infusoria." He was born in 1841, and in 1873 married Miss Mary Evans, whose acquaintance he had made at the house of his friend, Mr. H. P. Robinson, of Tunbridge Wells.

In 1861 he entered the Royal Arsenal, Woolwich, and for some years past conducted the Photographic Department there. Being a man of great mental activity, he got through a large amount of work in his leisure moments, and devoted much of that time to literary pursuits, contributing to scientific and other journals, and also writing interesting papers on the various places visited by him from time to time. The bright and chatty account of "A Trip to Sahara with the Camera," which has recently appeared in these columns, fittingly illustrated his powers of imparting much useful information in a cheery and humorous manner; and this power has also been recognised by the success of his "Photographic Studios of Europe," and other papers. His busy pen was also engaged at times in lighter literature; and "Daugerfield," and "George Vanbrugh's Mistake," may be quoted as perhaps the best written of his novels.

Nor was it only in literary work that his unbounded energies were spent. At the commencement of the Volunteer movement, he took it up with enthusiasm, and until a few years ago was a most active and efficient member.

In social life his presence was always welcome. With grown-up people and with children alike, his arrival was hailed with pleasure, for his bright and genial appearance seemed to bring sunshine whenever he appeared, and his power of entertaining a youthful audience was proverbial. Only the Friday before he died, he sent a most characteristic telegram to his friends at the Whitefriars Club, regretting his enforced absence, adding, in his humorous way, that he was prevented by a more pressing engagement (he was ill in bed at the time), but that "he was very jolly, nevertheless."

With all his love of fun, he had the kindest heart imaginable, and was ever ready to defend the weak cause, and to help those who were in trouble, so that his death will cause a void, which will not easily be filled, in a large circle of friends.

The interment took place at Abney Park Cemetery, at half-past four o'clock, yesterday afternoon.

A MIXED SODA AND POTASH DEVELOPER.

MR. NEWTON, at a meeting of the Society of Amateur Photographers of New York, proposed to use a mixture of carbonate of potash and carbonate of soda in the alkaline developer. He claims advantages for the mixture which neither of the alkaline salts possesses when used by itself. As chemists fully recognise the fact that certain reactions are more easily effected by a mixture of the carbonates, we are quite prepared to believe in the advantages which Mr. Newton claims for the mixture. Apart from all question as to any gain by using the two alkaline carbonates in conjunction, we may refer to the advantage of using the carbonate of potash or soda for the alkaline element of the developer, as the salts in question are easily obtainable in a pure state; and when the solutions are once made, mere exposure to the air will cause no alteration unless by the absolute evaporation of the water. We hope our readers will make up a developer in accordance with the following directions of Mr. Newton, and report to us on the result. Mr. Newton says:—

"Into a quart of water I put three and one-quarter ounces of carbonate of potash and three and one-quarter ounces of carbonate of soda; that will give you (reckoning four hundred and eighty grains to the ounce) very nearly one hundred grains to the ounce; a little short, but near enough for all practical purposes. If you buy the carbonate at the grocery stores, dry it before you use it—dry out the water. Into another quart of water I put three and one-quarter ounces of sulphite of soda. Those are the two stock bottles. Three ounces of each of those two stock solutions with six ounces of water added, will give you twelve ounces. In each ounce there will be twelve and one-half grains of each of those ingredients—potash, soda, and sulphite. That will give you twenty-five grains to the ounce of developing solution, that is, the carbonate of potash and soda. The sulphite will develop a picture, but it is not reckoned as a developer; it is used here to give color to a negative or to prevent color. The developer given will develop a picture without any restrainer, and give you a clear, beautiful negative, if the exposure is right. If the exposure has been too long, then you must add a restrainer or make it weaker.

"Now, in contrasting the soda developer or the potash, with the ammonia developer, there is this to be said in its favor: you are limited to a very small range with the ammonia developer. If you get up to six or eight drops to the ounce, you are pretty sure to get a fog any way—I do not care how much bromide you have in it—but with this developer you cannot get a fog with the strength that I have given you, twenty-five grains to the ounce for a very rapid exposure; two and one-half grains of dry pyro to the ounce, is the proper amount of pyro. If you reduce the strength, however, do not use but one grain and a half of pyro. As you increase your strength up to fifty grains, you run your pyro up to six grains to the ounce. You can go on up so that you will have to use twelve grains to the ounce, by increasing the quantity of alkali. The quantity of pyro must be in harmony with the strength of the alkali development in order to get the proper intensity.

"I have found, in my experience, that acid solutions of pyro after standing two months, lose four-fifths of their potency as a developer, so that I do not use them any more. I never was in favour of using pyro in solution anyway. Dry pyro is the best form in which pyrogallic acid can be used. Put the dry pyro into the solution that I have just given you; you can put it in half an hour before you want to use it. You can develop four or five negatives right in this same solution, one after another. I have developed four, and the last one was just as good as the first."

CAREY LEA'S THEORY OF THE LATENT IMAGE, AND ABNEY'S RECENT EXPERIMENTS.

Last week we alluded to some experiments of Captain Abney's, which prove that heat has a remarkable action in increasing the sensitiveness of the gelatino-bromide film; or, what comes to the same thing, that if two portions of the same film differ as regards temperature, the warm portion will be more sensitive to light than the cooler portion. The limits within which this holds good have not yet been determined, and this week we publish (page 315) an important communication by Captain Abney on the subject.

In order to render Captain Abney's main idea as clear as possible, we will translate a portion of his recent communication to the *Bulletin Belge*. He says:—

Your readers are aware that if a phosphorescent plate is exposed to light, and, after a certain time, the finger is pressed in contact with the back of the plate, it may be noticed that the luminosity increases temporarily; but after some time, the part which has been pressed becomes darker than the rest of the plate. If one is inclined to theorise as regards this phenomena, one will say that it is the heat which has caused the molecules of the phosphorescent tablet to shine more brightly. I concluded that if this is true, it might apply equally to the sensitive plate, and I will relate some experiments which I have made in this connection.

A phosphorescent plate was exposed to the rays of a source of light, and, after an interval, I applied a piece of heated iron to the back of the plate, the result being the production of a visible image of the piece of iron, the image being brighter than the rest of the plate. A similar experiment made with a piece of ice resulted in the production of a diminution of the phosphorescence. Afterwards I took a gelatino-bromide plate, and placed the same piece of hot iron against the back until the part was warm. I next gave a short exposure to light, and, after cooling, the plate was developed; the result being that the image of the piece of iron was visible. The sensitiveness of the plate was much increased by the application of heat.

Captain Abney next describes a perfectly similar experiment in which a morsel of ice was placed against the back of the plate, and an exposure was made while a part of the plate was still cold. A region of less sensitiveness corresponded to the outline of the ice.

The following experiments which we made with a sample of phosphorescent sulphide of calcium are strictly analogous, and serve to confirm the view of Carey Lea that the action of light on a phosphorescent body is strictly analogous to its action on a sensitive film. As far as we know, the stored-up light in sulphide of calcium can only be entirely removed by exposure to a somewhat high temperature; so in order to obtain a suitable sample free from light, we packed some of the commercial powder tightly into a crucible, and heated it to redness for half-an-hour, after which we allowed the whole to cool in a completely dark place. Working now in the feeblest ruby light possible, we used a fine saw to cut some slabs from the material, which was now agglomerated, so as to be similar in texture to bath brick, and the slabs were stored away in a perfectly light-tight box. A piece of hot iron was now held against one of the slabs so as to heat a portion, but as there was no light stored in the material, no luminosity was noticeable; but on exposing the slab to the light for a few instants, and then taking it into the dark, it was quite obvious that the warm sulphide, like the warm film, possessed increased sensitiveness to light. Local cooling produced the contrary effect, the sensitiveness to light being less where the sulphide was cooled. When the sulphide of calcium is warm it not only takes up light more readily than when cold, but also gives up or discharges the light more rapidly. Whether an exposed plate will lose its image more rapidly when subjected to heat than when kept cool remains to be seen; but if the analogy between the sensitive plate and the phosphorescent surface holds good we should expect this to be the case.

A letter from Mr. Killick, which will be found on page 315 shows that it has already been observed that a longer exposure is required on a cold day than on a hot day; but we do not find that it is at all clearly indicated that the heat actually increases the sensitiveness of the film. A person reading the article referred to (Year-Book, 1884, page 41) might conclude either that the film becomes more sensitive when heated, or that the developer becomes more active in hot weather.

As the theory of actinism propounded some seventeen years ago by Carey Lea has not received much attention in recent times, we print some extracts from our volume for 1867. Mr. Carey Lea says:—

If certain bodies, known as "phosphorescent," be exposed to a bright light, such as the direct rays of the sun, and then be removed to the dark, they will emit a very distinct light. This light continues to be emitted for a time of variable duration. With some substances it continues for days, with others it terminates in a few hours. Becquerel has enormously extended the number of substances that act in this way, by showing that the period of time during which they phosphoresce may be exceedingly short, and so escape ordinary observation. He constructed an extremely ingenious instrument by which phosphorescence could be made evident even when it continued for but a very minute fraction of a second, after the light which fell upon the substance was removed. These facts, then, embraced under the general term of phosphorescence, prove incontestably that bodies may, by light, be thrown into a state of vibratory motion, lasting for a longer or shorter, sometimes a very considerable, time after the exciting cause is removed, and that, so long as this vibratory movement continues, they will themselves emit light.

But light, such as it comes to us from the sun, is endowed with another property distinct from illumination, and which we conveniently term actinism. There is not the slightest reason to doubt that bodies may be endowed with the power of being impressed by these rays, and retaining them precisely as bodies may the illuminating rays. Herein lies the explanation of the physical or latent image. It is simply a phosphorescence of actinic rays. Once stated, the whole matter is so evident as to carry conviction with the simple statement.

Let me, then, explain the manner in which this phenomenon takes place with iodide of silver. Pure iodide of silver undergoes no decomposition by light when thoroughly isolated from all substances, organic and inorganic, which are capable of aiding in effecting reduction. But, if exposed to light, it continues for a certain time thereafter to retain the vibrations it received; and just for so long as these vibrations continue, will it be instantly decomposed if brought into contact with any substance which would have caused its decomposition had the two been subjected to the action of light together.

Iodide of silver, if exposed to light in the presence of pyrogallic acid and nitrate of silver, is reduced. If the iodide be exposed separately, it is thrown into a state precisely similar to that of a phosphorescent body, except that it continues to vibrate in unison with the actinic instead of the illuminating rays; and so long as this condition remains, if it be brought into contact with the above-mentioned substances, the effect is the same as if they had been exposed together to ordinary light.

For this property of light I propose the name of *Actinescence*, a name which, though not in every respect suitable, has the great merit of indicating the parallelism of the phenomenon to that of phosphorescence.

On what, then, does the faculty of receiving a latent developable impression depend?

On the possession by the body of two properties: first, that of being decomposed when brought into contact with certain agents in the presence of light; second, that of being able to retain the influence of the chemical rays, so that on being brought into contact with these agents after removal from the light, the same decomposition may be brought about.

The first of these properties is sensitiveness to light.

The second is actinescence.

The joint possession of the two renders a body capable of receiving a latent or physical image.

It is easy to conceive that a body may be actinescent without being sensitive to light. In fact, substances that phosphoresce with a blue light are probably actinescent also, but not being sensitive to light, they of course can form no latent image.

This new view will, I think, dispel all the mystery that has seemed to some to envelope the idea of a physical image, and

brings all the most obscure facts of photo-chemistry into parallelism with well-understood and very simple phenomena.

Phosphorescent bodies, after ceasing to shine, recover that power by another exposure to sunlight. So pure iodide of silver, isolated from all other bodies so that no chemical decomposition can take place, is capable, as I have elsewhere shown, of entirely losing one physical impression and receiving another, and doubtless an indefinite succession of such. The parallelism is perfect.

This new theory which I here bring forth, and which I shall develop more thoroughly later elsewhere, rests upon certain facts which I have long advocated and argued, and which are now, I believe, accepted very generally. They are principally:

1st. The sensibility to light of pure iodide of silver.

2nd. The spontaneous re-sensitizing of pure iodide of silver.

NOTES ON MESSRS. DARKER'S LECTURETTE.

The profusely illustrated lecturette on light, given last week by Messrs. C. and F. Darker, a resumé of which will be found in another column, was perhaps the most complete demonstration of the various phenomena rendered visible when a ray of light is studied, as falls to the lot of the ordinary photographer to witness. The subject of light is one which should engage a great deal more attention than it does.

Another portion of Messrs. Darker's discourse had reference to the production of kaleidoscopic effects by means of the lantern, which hitherto has not been done to any great extent. Not only were the usual chromatic effects obtained in the lecture referred to, but a new field is opened up for photography. Photographic films suitably arranged may be made to assume designs of the most exquisite kind when projected upon the screen, and by a careful selection of suitable subjects much amusement may be derived. Prof. Tyndall has rendered familiar many interesting phenomena met with in the study of light, and the photographer, beyond every other scientific worker, requires to familiarize himself with its intricacies.

PHOTOGRAPHY OF YELLOW, BLUE, AND OTHER COLOURS IN THE TRUE PROPORTION OF THEIR INTENSITY.

BY DR. H. W. VOGEL.*

In the paper already published I have thoroughly described the method of working with the colour collodion, and now add some observations which are the result of my more recent experiences.

1. From 2 to 3 per cent. of alcohol should be added to the silver bath, No. 1 (see page 291).

2. When the yellow glass is not used, it suffices to give double the exposure which would be required if an ordinary iodised collodion were employed.

3. When the yellow glass is used, the exposure may be estimated at about five times what would be required in the case of ordinary work on iodised collodion.

4. As eosine is alkaline, and not only neutralises the silver bath, but may occasion further mischief by its decomposition, both baths should be tested before use, as follows:—A drop of a solution of potassium permanganate containing one part of the salt to fifty of water is added to the nitrate solution, and if the rose colour disappears immediately, a second drop is added, and so on until the tint remains for the period of one minute. After this the solution is tested with litmus paper, and is, if necessary, made slightly acid; acetic acid being used for bath No. 1, and nitric acid for bath No. 2.

Baths which, in the hands of my pupils, gave comets and stains, were quickly restored to a good working condition by being treated with permanganate of potassium, as above described.

When, however, organic compounds have accumulated in the bath, it is not sufficient to treat it in the cold with permanganate of potassium, and it is necessary to heat the solution to the boiling point in a porcelain dish, and treat it gradually with permanganate solution, as already described. When the rose colour remains for half a minute, the solution is filtered and treated as before. Permanganic acid is to be preferred to the potassium salt, but its use naturally requires spirit, skill, and care.

The grain of the paper in copying.—It is a very remarkable fact that the grain of the paper shows very much less when a negative is produced by the new method, than when made by the usual process on iodised collodion, and this circumstance has been so often proved by my own experiments, and by those of my pupils, as to be beyond doubt. It may be that the shadows of the grain are mainly lighted by the yellowish reflections from the studio, and the yellowish light counts far more in the new process than in the old.

In the ordinary wet process iodide of silver possesses but little sensitiveness for the deeper shades; while bromide of silver also requires very long exposures to reproduce the deeper shades in the case of studio work; but a mixture of the two salts is, perhaps, ten times as sensitive to darker gradations. Something analogous occurs in the case of the spectrum, as, with a short exposure, iodide of silver is only impressed a little beyond the line G, that is to say, in the dark blue. Bromide is impressed under similar circumstances as far as the line F (bright blue); but a mixture of both is sensitive as far as the bluish green (lines *b*, E). In such a case, it is pretty clear that an especially sensitive silver compound is formed, which explains the peculiar action of eosine in the wet process. In the case of a dry plate this compound appears not to be formed, and the eosine merely acts as an optical sensitizer.

Thus, in the case of a wet plate, eosine acts not only as an optical sensitizer, but also as a chemical sensitizer; cyanosine, for example, is analogous to its action; but other colouring matter, as fuchsin and Magdala-red, act merely as optical sensitizers. In the wet process only such colouring agents should be used as are both chemical and optical sensitizers.

The next problem was to make the eosine silver compound available in the gelatine process, and for this purpose four cubic centimetres of eosine solution containing 1 in 400 were precipitated with 2 drops of a ten per cent. solution of silver nitrate, and the precipitate was dissolved in 2 drops of ammonia; when 4 drops of this solution were added to 10 cubic centimetres of gelatine emulsion, a notable increase in the sensitiveness for the yellow was noticed; indeed, tenfold the increase noticed when a mere addition of eosine with ammonia was made.

In conclusion, it may be remarked that the region of activity resulting from the use of eosine in photographic plates does not correspond exactly with the absorption spectrum of an alcoholic solution of the dye, but tends more towards the yellow. This fact will not surprise the experienced spectroscopist, who knows that through the action of highly refracting media a shifting towards the red occurs. Eosine, besides giving an intense absorption line in the greenish-yellow, gives also a fainter one in the bluish-yellow; but the influence of the latter is most notable when methyl eosine is used.

* Additional Remarks to a previous paper, page 273.

By-the-Bye.

AMATEURS AND PROFESSIONALS.

Now and then—at wide intervals, perhaps, but still with recurring regularity—there comes a bout at sparring between the amateur and the professional photographer. The latter generally begins it, we must say; but then, on the other hand, no doubt, there is sometimes a good deal of provocation. Photographers are not the only people who quarrel

in this way. The actor makes his perennial protest against amateur theatricals; the scribbler complains that publishers want to be paid to publish now-a-days, there are so many amateur authors; and the painter laments that people in comfortable circumstances take up with palette and easel. In fact, the photographer may consider himself the best off, in this respect, among professional men.

That there are thoroughly good amateur photographers, just as there are very capable amateur actors and singers, is a matter beyond denial; still it is just as obvious that the number, in whatever walk of life you seek them, is but few. But as regards ordinary professional work and ordinary amateur work, there is a wide difference between them. This holds good, whether it is of amateur photography, amateur acting, amateur writing, amateur carpentry, or amateur engineering, you speak. That dilettante work, for excellence and uniformity, cannot be compared to professional work, is the rule, and the existence of a few capable amateurs is the exception that proves it. This is so in photography as in everything else; when you have skimmed from the top the names of a score or two of capable men, there is left the mass of ordinary workers, who produce, by dint of much care and attention, very fair results, but who could not produce such results with the same certainty nor of the same excellence, as the every-day professional who possesses taste and skill. It would be very strange indeed if it were otherwise.

Do not let us be misunderstood, however. We are far from saying that all professionals are superior to amateurs in photography, or in acting, or in anything else. Heaven save the mark. Unfortunately, photography is a calling not unfrequently adopted by men who have tried everything else, and failed; but the broken-down tailor or frozen-out gardener, who take to blacking their fingers and messing about with developers late in life, scarcely demand serious attention. We speak of the professional photographer as someone whose taste and inclination have led him to learn and practise the art, and who, having to earn his bread, is likely to strive heart and soul to master the difficulties in his way. With the same natural abilities of the amateur, he simply progresses more because he labours more; and that practice makes perfect, is an axiom that dates back as far, at any rate, as old Solon.

We have said something about provocation on the part of amateurs. This is not very serious, but still it is annoying to find a portrait has been copied and printed in a private studio, and that the credit and emoluments attached to it are henceforth diverted. Of course, when the amateur begins to take portraits for a fee, and to print negatives at so much a dozen, he ceases to be an amateur any longer, and all opposition ceases also, for it is not too much to say that five out of every six photographers were amateurs once upon a time. In fact, in any calling in which art finds a place, there is scarcely any other way of entering the profession. The actor is sometimes engaged about the theatre in a menial capacity before he blossoms forth in a speaking part, but, as a rule, he is an amateur for years before he adopts the stage as a profession. A boy or girl who is clever with the pencil may be sent by parents to an art school, to learn perspective and study chiaroscuro; but it is not this early phenomenon that usually turns out the successful painter; he steps out from any and every rank of life, and comes to the front in vigorous strides that know no halting. *Nascitur non fit*, they say of poets, and we should like to apply the quotation here also, but for the reflection that if to be a poet you must be born one, the same holds good, too, of fools and idiots.

As the ranks of the militia are the natural recruiting ground for the regular army, so it is from among amateurs that professionals are chosen. Mr. Henri Rocher, a well-known United States photographer, recently remarked in an address that amateurs gave him no fears, and that he should not make himself uneasy "on account of the amateur photographic craze." He might have gone further and said that he looked upon the "craze" as matter for congratulation, for in this country, at any rate, where there are probably more amateurs than elsewhere, photographic progress is deeply indebted to the amateur. Recruiting the ranks of professionals is the least he has done. With us, the amateur has been the pioneer, whether in respect to the art or science of photography. Medals at exhibitions are so frequently taken by amateurs, that the matter causes not the least remark, and no committee or jury has ever dreamt of dividing the prizes into two sections, the one to be taken by amateurs, the other by professionals. There was no need. Few, comparatively speaking, as may be our first-class amateurs, they are quite capable of holding their own, while exhibitions there have been in this country repeatedly, where the amateur has outdistanced his brother altogether in the race for distinction. No better incentive could have been given to the professional photographer.

It is the same in the science of photography. Look at our Societies, and you find half their members composed of amateurs. Nay, more; in the papers and discussions that come before these societies, it is the amateur who is the more active man, and who is generally the experimentalist. In fact, with us—if it were not that we have in our Gordons, Conways, Berkeleys, Gales, Brightmans, Manfields, &c., artists in the first rank—we could almost say that the rôle of the amateur is a distinct and separate one to that of the professional, inasmuch as the latter makes perfect what the former, by dint of patient investigation and subtle research, have made possible. In any case, no professional in this country would deny the useful rôle of the amateur, nor the assistance the latter has lent, time after time, in helping the art onwards.

Again, there are certain regions over which the amateur holds undivided sway. In micro-photography there is but little inducement for the professional photographer; it is a work in which scientific investigation is intimately connected with photography, and unless taken up by the amateur, it would not be taken up at all. When it comes to spending a whole afternoon on focussing a single object, and choosing the best lens and best exposure to suit it, naturally the ordinary professional photographer must find such labour unprofitable. It is the same in other instances when photography is intimately connected with science; as, for instance, with astronomy, medicine, or mathematics. If we had no amateurs, we should have no successful results to be proud of, in all these connections, and, what is more, the professional would have less to feed upon.

In fact, we may go a step further, and say that whatever may be the influence of the amateur upon other callings, upon that of photography he has proved himself of signal benefit. If Mr. Rocher had pointed out how the professional photographer, rather than fearing the amateur, should regard him as a benefactor, he would have done some service by placing the matter before his American brethren in its true light.

THE PHOTOGRAPHIC TEACHINGS OF ART CRITICISM.

BY A. H. WALL.

I remember one of Mr. Ruskin's earlier papers on art, which set out with the assertion that for every separate class of books or pictures there should be a separate public or set of critics. He argued, for instance, that the works of Turner were "deeply toned poems intended for all who love poetry; but not for those who delight in mimicries of wine-glasses and nutshells"; that they were "deep treatises on natural phenomena, intended for all who were acquainted with such phenomena, but not for those who, like the painter Barry, are amazed at finding the realities of the Alps grander than the imaginings of Salvator, and assert that they saw the moon from Mont Cenis four times as big as usual, from

being so much nearer to it!" * He claimed for Turner's works, that they were "studied melodies of exquisite colour, intended for those who have perception of colour, not for those who imagine that all trees are Prussian green." Proceeding, he pointed out that while Newton's Principia would find few to understand or criticise it outside the Royal Society, the poems of Wordsworth could be judged by all who had hearts, and those of Moore by all who had passions. He held that Hogarth's works appealed only to those who were observant of human life and character, and said pictures by Giotto were only intended for critics inspired, as their painter was, by the fervour of deep religious feeling.

The legitimate conclusion from this line of argument was that we should accept no critics of Newton who were ignorant of mathematics, no critics of Wordsworth who were heartless, and none of Moore who were cold and passionless. "Each work," said he, "must be tested exclusively by the fiat of that particular public to whom it is addressed. We must not submit a treatise on moral philosophy to a conclave of horse jockeys, nor a work of deep artistical research to the writers for *The Art Union* (now better known as *The Art Journal*). The public, when referred to with respect to a particular work, consist only of those who have knowledge of its subject, and possessed of the faculties to which it is addressed. If it fail of touching *these* it is a bad work; but it in no degree militates against one that it is rejected by those to whom it does not appeal." It is well known that artists, in criticising a work of art—say for exhibition on the walls of the Royal Academy—are apt to value it in proportion to the technical excellences it displays. They give the mechanical difficulties overcome in its execution, and the skill displayed in the development of accepted rules and principles, precedence over qualities which constitute a more real and important claim to public notice. For this reason their judgment is often antagonistic to that of thoughtful and observant critics who are without technical knowledge, but who are quick to see in art what they have studied in nature. This lends force to Ruskin's idea. Pictures are not painted for painters.

No better illustration of what I mean is to be found than the difference between Ruskin's "Modern Painters," and those sets of lectures delivered by a succession of Royal Academicians to the students of the R. A. Schools, which are still given as prizes to successful students. From those of Sir Joshua Reynolds, downwards to those of Fuseli, each follows in the other's well-worn footsteps. Design, composition, chiaroscuro, and colouring, are the group of subjects to which they are all confined. The illustrations and examples advanced were drawn exclusively from famous paintings and the ancient Greek sculptures, and when anything was added, it invariably consisted of the backneid accounts of the progress these had made, by painting, architecture, and sculpture, in different countries and successive ages.†

Ruskin, the founder of a new school of art study and criticism, wrote very differently.

Although, being himself a practical and talented artist, he was probably as familiar with technical necessities, requirements, and scientific rules as any of the R. A.'s were, he justly considered them only as weak inferior means to great and superior ends. He constantly urged upon students the primary importance of more careful and accurate observation of nature, with the adoption of all such means of investigation and explanation as would help them to a fuller understanding of its grandeur, beauty, and mysteries. He denounced as beyond everything bad "that wicked pride which makes man think he can dignify God's glorious creation, or exalt the majesty of the Universe." He urged that honest, earnest, faithful study of nature would demonstrate most forcibly and practically the real importance of all mechanical and scientific aids, and at the same time develop feeling, imagination, ambition, loftiness of thought, and last, not least, humility.

The great landscape painter, Turner, in all I have read and heard about him, appears to have been neither literary nor learned, and the ignorance Ruskin scorned in Barry was probably very much less than that which he ignored in Turner. But Barry's ignorance was proud. He thought that in depicting the wildly grand and romantic scenes of nature, a great painter's imagination could surpass the reality: whereas, Turner appears to have known how woefully short his grandest achievements fell when contrasted with the natural effects from which they were but faint far-away echoes.

Ruskin himself once asked (the purest white of the palette being as black compared with the white of sunlight, and the purest black as white compared with the black of nature's darkest shadow) how we could hope to emulate the gradations of nature's light and shade, with only our black and white paint for its two extremes of light and dark? Obviously, not by merely painting white light with white paint, and intense darkness with black paint seen in light. Here, then, we have a practical illustration of how the study of nature leads to the study of all those aids of which the R. A.'s speak in their lectures—technical, mechanical, intellectual, or simply mechanical. An artist who, by studying nature, has become deeply impressed with the comparative insufficiency of the means he has for its representation, will certainly neglect nothing that may assist in bringing his glorious aim within the scope of a powerful realization. Whether it be his object to touch the heart, arouse the passions, recal natural phenomena, or hold up to humanity Hogarth's wonderful mirror of character and action, he will bring to the task every faculty of his intellectual and physical nature, and every practical discovery of his greatest predecessors. He will know what to look for, and where to look for it, and with such knowledge his chances of success will be enormously increased.

And all this, if rightly understood and studied, is as fairly and practically applicable to photographic art-study as it is to any other.

Technically and scientifically, photography has of late years made wonderful strides. We can hardly hope that it will attain much greater perfection in the direction of processes and tools; but there is a world of discovery and application before it in an artistic direction—a world which is as yet in the very infancy of its discovery.

Every now and then some lucky operator or artistic student is startled into wonder by the striking superiority of one particular negative. But I am afraid it is not often that he sets to work and finds out by what special or combined effects, natural—optical, artistic, or chemical—such exceptional results had been obtained. Proofs from such precious negatives are in many a painter's folio, cherished as sources of instruction and inspiration. They teach the artist because he knows how to dissect them and trace effects to causes; but they would be useless to him if he had studied neither nature nor art, but simply set up his easel and prepared his canvas and palette as some photographers set up their cameras and prepare their dry plates for exposure mechanically.

Photographers as a body should make that use of art examples which artists commonly do of famous paintings and sculpture; that is to say, they should discover the principles underlying effects of modelling, chiaroscuro, atmosphere, pose, expression, tone, sentiment, design, composition, or feeling, the technical elements by which they are applied, and their proper effects when most powerfully realized. In that way they may learn to criticise a work of art, and apply the discoveries they make to their own productions.

* Barry, of whose singular ignorance of natural phenomena Ruskin notes this striking instance, may have been unfitted for criticising such works as Turner produced, but the lectures he delivered to the students of the Royal Academy are full of original thoughts expressed in vigorous language, and based on the correct principles of drawing, design, composition, and colour; showing him to have been a careful student, and no mean critic. He was, however, essentially a figure draughtsman, and his view points were frequently too exclusively technical.

† It will be only fair to add that the field of teaching at the R. A. is now of a sounder and more extended character.

I sometimes imagine what marvels in the way of art photographs Daguerre would have achieved had he been amongst us now. His early dreams were of a much higher stage of perfection than the Daguerreotype realized, either before or after his death. His cravings were for pictures which should have all the charms of nature, including colour; and as he was himself a painter of great excellence and repute, it is not difficult to conceive how his artistic and scientific studies, blending with his untiring perseverance and industry, if backed by our advantages, would have produced pictorial results of the greatest beauty and highest pretensions.

A dear old friend of mine—now, I grieve to say, dead, who was a clever painter before he became an art-photographer—O. G. Rejlander, used to moan sadly over the rapidity with which his plates lost sensitiveness in the camera when, after thoughtful, painstaking posing, grouping, and lighting, he strove to act upon the thoughts and feelings of his models for telling some story which his fine imagination had previously conceived as a subject. The operator of to-day has the great power which he coveted so vainly; but still, it is not often that we see photographs which equal or surpass the productions of Rejlander in those qualities of imagination, sentiment, feeling, and picturesque effects, for which they were so remarkable.

It was this thought which prompted the utterance I have committed to paper.

I would fain impress upon young photographic students who are not too proud or too successful to need advice, two things: first, the desirability of their pleasing those whom it is the highest honour to please—the real critics described by Ruskin; and, secondly, the folly of uplifting means above ends, and expecting to master effects by neglecting causes.

Review.

THE A B C OF MODERN PHOTOGRAPHY. BY W. K. BURTON, C.E. Fourth Edition (*London: Piper and Carter*).

WE can say but little as to a book which has originated in our columns, but the work now before us has so far outgrown the limits of the "six lessons" as they appeared in the PHOTOGRAPHIC NEWS, as to form a compact but comprehensive manual for the beginner. It is, indeed, just the book to put in the hands of a person proposing to become an amateur photographer; while the fact that it contains a large mass of carefully compiled information, and a good index, make it a useful book of reference to those who merely wish to practise the gelatine emulsion process and the usual method of silver printing. Indeed, the proportion of amateurs who go beyond this is not at the present time a very large one; but in addition to the every-day branches of photography just mentioned, we find a mass of useful information, including the platinum printing process, the production of transparencies on gelatino-chloride plates, home portraiture, and many other topics.

FRENCH CORRESPONDENCE.

M. AUDRA'S EXPERIMENTAL MEETING—PHOTOGRAPHY IN COLOURS—SALON NUMBER OF L'ILLUSTRATION—RAPID COPIES OF ORIGINAL NEGATIVES—OPERATORS' EXAMINATIONS—POCKET PHOTOGRAPHIC APPARATUS.

M. Audra's Experimental Meeting.—Some few days ago the Photographic Society of France assisted at an experimental meeting, at which one of our most active and distinguished members, M. Audra, demonstrated before a very large audience his process of preparing gelatino-bromide of silver emulsion, and method of coating plates. This process, explained by its inventor with great clearness, does not present anything new, but it was very interesting to a great number of the members, who, being amateurs, had neither made nor seen emulsions made. It is well known that both professional and amateur photographers prefer to get their plates from some well-known maker, but it is at the same time useful to them to know how the sensitive composition is made. The example set by our sympathetic colleague is worthy of being followed; and the favour with which it was received by the audience testifies to the great interest attaching to an experimental meeting. It is to be hoped that the Society will, from time to time, encourage reunions of this kind.

A True Version of the So-called Photography in Colours.—A certain rumour has been spread abroad concerning a pretended invention of photography in colours, but it is called photography "of" colours, and one reads short paragraphs in the newspapers like the following:—"Photography of colours is now an accomplished fact. For some time past M. Charles Cros has been experimenting in this direction. It is an engraver of Versailles who has definitely found it out. A few days ago he made known his discovery to the Minister of Fine Arts, who charged him with the reproduction of a picture. Three prints were successively taken, and all succeeded admirably." On examination it is easy to see that they are in too great a hurry to cry out victory. The process does not yet arrive at the solution of the problem of reproduction in natural colours. Napoleon I. said, "*Le boulet qui me tuera n'est pas encore fondu!*" (The bullet to kill me is not yet cast.) We can also say of the process in question, that it has nothing to do with the desired solution. I am perhaps better able to speak on this subject than any one else, as the inventor submitted his results to me; I also furnished a plate and coloured object which he reproduced, and I do not hesitate to say that the results were in the least satisfactory. This gentleman confesses that he uses colours, and I am of the firm conviction that colours are employed diluted with albumen, then sensitised with nitrate of silver, and when dry exposed behind a negative. It is therefore apparent that this attempt and a reproduction of colours are as far off as possible.

The Salon Number of L'Illustration.—It has been generally noticed, as also in the last number of the PHOTOGRAPHIC NEWS, that the illustrations of this journal are phototypes by Meisenbach, of Munich. For a long time I have always declared that photographic reproductions would so ingraft themselves upon printing, that they could not possibly be neglected: and the phototypes from pictures of this year's *Salon*, reproduced in *L'Illustration*, prove that I am right. These reproductions are not perfect, perhaps, but the negatives were, as M. Chéron tells us, taken under rather unfavourable circumstances, and the coloured ink employed in the printing seems scarcely suited to the subjects. We must not forget that perfection is not to be arrived at at the first trial, but the commencement is certainly praiseworthy.

Method of Obtaining Copies of Negatives.—I should like to call the attention of our readers to a method of easily producing copies without recourse either to the camera or any printing process requiring development. Suppose one disposes of a negative by sending it to some house for engraving purposes, or gives it away, at the same time desiring to have an equivalent as perfect as the negative. Take a good print and fix in hypo without toning. It must be sufficiently printed, but not over-done. When fixed, its yellowish-brown colour renders it very non-actinic. The negative copy is obtained by exposing the print to sunlight pressed against the same kind of sensitive paper; fix with hypo, and one has, in spite of the grain of the paper, a negative image from which may be taken as many prints as desired. By waxing the negative, the paper will be more transparent, and the printing hastened, giving softer impressions. Care must be taken not to over-expose the negative when taking it

from the print, as it will be rather hard. Toned positives do not give such good results.

Operator's Examinations.—The examinations for candidates desiring certificates of capacity as photographic operators will be held towards the end of May.

Conference on Pocket Photographic Apparatus.— The *Chambre Syndicale* is about to organize a conference relating to photography with the aid of pocket apparatus. The entire work is to be shown in the presence of an audience, comprising enlargements from the tiny negatives and the projection of positives which have been taken. The bearer of the signature to this letter is charged with this conference. Pity him! LEON VIDAL.

PHOTOGRAPHERS AND SITTERS.

BY G. G. MITCHELL.*

RAPID changes in our art soon make the past grow old. The collodion age, with its capricious baths and laborious manipulations, has practically passed away, so that the present generation only know in part of the troubles and difficulties of earlier workers. Many of us know nothing of them, and the rising one will read of them as ancient history. Old faults are overcome, while with the advance of processes, new troubles rise and task our patience and carefulness.

It is the case, generally speaking, that a person who steps into a studio for the purpose of having a portrait taken, does so in what may be called a smiling frame of mind. The idea is commonly looked upon more or less as a sort of joke, or at least, something that is alluded to with a smile, and as if the proposal needed just the faintest approach to an apology. Whenever this is observed, and it will be often, it should be accepted as the key-note to what intercourse may follow. Other sitters come in serious moods. Partings and unhappy events bring business, as well as joyful occasions. Death itself at times demands our services, and thus we do not always work under the most favourable or cheerful circumstances.

If, as Pope says, "the proper study of mankind is man," perhaps in this matter of portrait taking we, who are engaged in it, see as considerable a share of the human nature about us as most people who serve the great British public. Some studios of course invite, in the very nature of things, certain classes. In some the comparatively poor man is never seen, and in others again the aristocrat is a *rara avis*, or unknown. The experience of these two extremes in many respects is very different, and both possess advantages or difficulties of treatment peculiar to themselves. The better classes, without question, are, for example, more refined in feature, and of course much better dressed. The sanctity of the æsthetic hangs about them, all of which are distinctly great advantages and aids towards successful portraiture. The educated face in any class has generally an indication or suggestion of something superior behind it. Low caste or very unintelligent features do not attract the interest of any one, save it may be as a study of physiognomy. Subjects vary immensely in the facilities they afford for good composition, and so on, and I believe it will be agreed that it actually demands from every one more tact and knowledge of effect to make a passable picture of a common-place subject than with one of a higher type. That, I think, ought to be obvious at a glance.

Perhaps I may be permitted to touch briefly on a few of the characteristics and odd points occasionally met with in sitters in our every-day practice. Popular ideas about portraiture, as about many other things, are often erroneous. Among these I would mention, for example, the notion commonly entertained that the photographer will do all that is required himself. "He knows best," and so he does, doubtless; but Giles and his sweetheart go into the studio as nearly as possible in the character of lay figures. They have an honest resolve to be docile in order to get a good likeness, but wanting in intelligent conception how to assist to this end. This sitter is probably more frequently found in the shape of the country cousin than the town one, but they come from all quarters. When the lay-figure sitter is taken to be posed, his distressing condition is most vexatious and trying; and it taxes the artist, who had better smile and bear it, to get him by any kind of artful byplay to feel at his ease and relax the rigidity of his muscles; but no one unacquainted with the actual fact in extreme cases could fairly credit how difficult is the task. The sitter is gently inclined to this side a little, or to that, and he mechanically obeys with all the elegance of a leaning chimney pot. But there is one grand feature about this man—he never asks for credit, unlike my Lord Heavymasher, who may give a world of trouble, and to whom the idea of cash payment is "bad form."

It is not sufficiently understood by many that whatever peculiarity of expression is worn during the sitting, that must be produced in the photograph, such as tight-set lips or elevated eyebrows. Nor, again, is the effect of certain little covert movements, sometimes indulged in, correctly reckoned upon. Miss Jones, for instance, stands pleasantly as placed, and all seems finally arranged for the moment of removing the cap, when she executes a little manœuvre on her own account by shifting a hand or re-arranging something which has not been to her mind exactly, which may turn out all right, but is quite as likely to be all wrong. In this same connection sitters will occasionally allow themselves to be posed with the head-rest; but having a dislike to its use, from the impression that it makes them look "stiff," quietly remove their heads from it at the moment of exposure, and by so doing generally expose their having done so.

Ladies very generally miscalculate the effect of *primming* the mouth. That feature is one over which, after a comparatively early age, they manifest a great solicitude, and it is precisely on account of this anxiety where the danger arises of a slight distortion. I need scarcely remark that it almost invariably takes the form of contraction. But the weakness is not exclusively confined to one sex. I have seen fellows with moustaches do it.

Another great blunder made is to suppose that the more unconcerned and indifferent one looks the better it will be. Under this impression we all get visitors who want to be taken with their legs and arms sprawled over the place, or they dump themselves down in a heap before the camera in defiance of every grace of form or gesture that has been known to man.

Again, we have a visitor who had once been young, and, it may be, blooming, who, after looking at various styles of work, will, in conclusion, point to some pretty girl's portrait, and, apparently oblivious of any difference in the originals, give us a commission to "take me just like that." How is it possible in these circumstances to explain the impossible, even in the most gingerly chosen terms? It is better to do your best, and leave the rest to fate, which is often very kind.

What I have said has had reference to studio work. There are other phases equally fruitful of remark.

* Abstract of a paper read before the Edinburgh Photographic Society.

Notes.

A paper which Dr. Vogel contributes to the NEWS this week gives important working details regarding his method of photographing colours in the true proportion of their intensity; and next week we shall publish some further investigations of Dr. Vogel about the action of cosine on photographic films.

English photography, apparently, holds a much higher position than it did some years ago. At one time the photographs of Austrian and German photographers were generally to be seen in our shop windows, but these have long since been superseded by the production of our own men, and in the course of a short trip lately in Belgium and Holland, we noticed that a large proportion of "portrait studies" exhibited in the principal towns were by English photographers. Had the photographs been those of celebrities, the reason for exhibition would have been obvious, but in most cases the sitters were utterly unknown, and the photographs had evidently been selected for excellence of manipulation alone.

The "Copyright (Works of Fine Art and Photographs) Bill," brought in by Mr. Hastings, Mr. Hanbury-Tracy,

Sir Gabriel Goldney, Mr. Agrew, and Mr. Gregory, is of the most comprehensive character. The mere enumeration of the headings relative to photographic copyright will at once stamp the importance of the measure. What may be termed the purely photographic clauses are as follows:—Copyright in photographs done by an assistant, servant, or workman to belong to the employer; photographic portraits taken on commission not to be sold or exhibited in shop windows without consent; copyright not to prevent the representation of the same subject (that is to say, two photographers may photograph the same scene or the same picture without infringing each other's copyright): copying a copyright work as part of a scene (an interior, for instance, containing a copyright picture) no infringement of copyright. There are also several clauses applicable to photography relative to penalties for infringements, power to search houses and seize unlawful copies, the seizure of pirated copies in the possession of hawkers, the prohibition of the importation of pirated works, &c. The Bill, which was issued on Tuesday last, is a most important one, and deserves the careful consideration of photographers.

The framing of an Act of Parliament is, however, one thing, and its construction another. A case in point was heard last week at the Wandsworth Police Court, in which Mr. W. Taunt, of Oxford, sued Canon Erskine Clark for publishing an illustration of St. Nicholas Church, Newbury, which he (Mr. Taunt) alleged was a colourable imitation of one of his photographs. It was not denied that the illustration was taken from the photograph, but counsel for defendant urged that it was neither a copy nor a colourable imitation as provided by the Act, and the magistrate, in the absence of any precedent, this being the first case of the kind, coincided. He accordingly, as we stated last week, dismissed the summons, but granted a case for a superior court.

In the new Bill, clause 14 sets forth, with much elaboration, that "no person shall make, or cause or procure to be made, for sale, hire, exhibition, or distribution, any copy, repetition, or colourable imitation of any work of fine art, or of any photograph, or of the design of any work of fine art, in which work, design, or photograph, or in the negative of which photograph, there shall be subsisting copyright, or of any part of such work, design, or photograph, by any means, in any material, or of any size, either in or by the same or any other class or kind of art, as or than that in and by which the original work was executed," and much more to the same effect. But the Bill does not, nor could it, define what is meant by colourable imitations, hence litigation on this point is by no means put an end to.

A lucky photographer at Darmstadt has secured what may prove an historical picture. He has taken a group of the Queen, her daughter, the Crown Princess, her granddaughter (Princess Charlotte of Prussia), and her great grand-daughter Princess Fedora of Saxe Meiningen, aged five—comprising four generations.

The organization recently formed by the amateurs in New York is likely to lead to very material progress as regards photographic work in the New World. Hitherto photographic societies in America have been, in the main, trade associations, and comparatively little has been done to encourage amateurs.

To illustrate this point, we may refer to a remark made by Mr. Pancoast, of Philadelphia, when he visited the Photographic Club a week or so ago. He said:—"In the States we find it difficult to get the members of our Association to talk, and if one man is disposed to say anything, he may keep possession of the meeting for the whole evening. The majority come to listen, not to speak. Here I see that each one is so anxious to say what he knows, that very often the chairman has a difficulty in determining who shall have the longest say."

In the *Philadelphia Photographer* we find a long and interesting report of a meeting of the New York Amateur Association; and so numerous were the subjects brought under discussion, that we should not be surprised if Mr. Pancoast finds a new condition of things on his return.

Several novel shutters were shown. Mr. Beach, of the *Scientific American*, gave a demonstration of enlarging on gelatino-bromide paper. Mr. Newton and others gave the results of their experience in searching for the best developer (see page 305). Mr. Hull referred in glowing terms to the comfort he had experienced in discarding ruby glass in the dark-room, for the olive green glass and two thicknesses of lemon yellow paper.

Death has indeed been busy in the ranks of scientific men of late. Adolphe Wurtz—whose "Leçons de Philosophie Chimique," published just twenty years ago, served to bring about the change of thought which resulted in the universal adoption of the new notation—died on Monday last.

From Chicago a new fortnightly, *Photography*, comes to hand. It is under the editorial management of Mr. F. H. Davis, and the first number contains a good selection of matter.

We witnessed an amusing instance the other day of photography being used to prove a self-evident proposition, as Sam Weller has it. At Carthagena, there happened to be a quack doctor, a glib-tongued young fellow with long flowing hair and pointed moustache, who harangued the people on the market place with considerable fluency. He was no new upstart, he said, but the veritable Dr. Francesco, of whom they had all heard, and of whom the pamphlets he held in his hand spoke so eloquently. But to remove all doubt as to his identity, he would hand round photographs to prove what he said. Whereupon, in the coolest manner possible, he held up to view some photographs of himself with name and title printed underneath. Could anything more conclusively demostrate that he was somebody?

There is, however, one application of photography to prove identity, which would be very useful to banks and the travelling public, if made use of. We mean in connection with the payment of letters of credit. An Englishman goes abroad, and instead of taking money with him, secures letters of credit from his bankers on various towns he may visit. The banker at home supplies these correspondents of his with his customer's signature, and mentions the maximum sum to be drawn. But, occasionally, the local agents are unused to the business, or are unduly impressed with its importance, and the consequence is, that at times a good many tedious formalities have to be gone through. If, however, a photograph of the customer were sent with the letter of advice, a simple and effective means of identification would be at hand.

"Have you any spoilt photographs to give away for my collection?" writes a painter to a photographer of our acquaintance. Neither the request nor the way it is worded will be unfamiliar to many of our readers, and they will do well to reply, "Have you any spoilt sketches that will go in *my* collection?" The painter will then probably realise the fact that it is impolitic to give away "spoilt" things, and that as he does not like to risk his reputation by parting with defective work, so possibly the photographer with a name might be equally reticent. There is the same similarity, he will find out, between a sketch and a photograph, as there is between a moat and a beam.

Some years ago we pointed out in these columns, as did Mr. Tunny shortly afterwards, that the transfer paper on which carbon photographs are laid, not unfrequently became yellow, and thus suspicion of fading was cast upon the carbon prints themselves. Some samples of unsensitized albumen paper exposed to light in a show-case for the same time as finished prints contained therein have lately come under our attention, and here, while the pictures became yellow, the untouched albumen paper had become equally so. In this case, therefore, what discoloration existed was clearly due to the paper itself, and not to any imperfect washing of the print on the part of the photographer. We suspect there are many albumenized papers, especially among the cheaper qualities, open to this suspicion.

How pleasant it would be if all sitters were as sensible and as philosophical as the lady who some time ago sat to a well-known photographer. In criticising the proofs, she remarked of one, that according to some of her friends she looked like "a simpering idiot," naively adding, "but I suppose it is like me." Subsequently, she wrote: "Yes, the 'simpering idiot' is the best"; and gave a good order from this particular negative. "Save, oh! save me from the candid friend," is a prayer which ought to be offered up by all who have their portraits taken. In this instance, common sense rose superior to captious criticism.

In Cologne, the police and a certain section of the professional photographers have been continually engaging in contests on the Sunday question. Not always as to whether portraits may be taken during service times on the first day of the week, but whether they may be exhibited. Herr Overheydt, being recently charged with carrying on his business contrary to the law, was acquitted after three appeals, because it was proved that the actual pictures on exhibition were not for sale.

Darwin was one of the first to appreciate the value of photography in recording expression. Two years ago, our readers may remember, we gave some examples in these pages of human expressions—of pain and suffering, of joy and grief, horror and disdain—the late Mr. Rejlander posing as the model in some of these studies. Although the pictures we allude to were wood-cuts, being, indeed, extracted from Mr. Darwin's book, they were faithful copies of photographs, and represented the intention of the author with considerable force.

But photographs pure and simple would be still more truthful in recording expression, whether the pictures, as in the case of Darwin, are required by the philosopher or the painter. The latter would be spared much of his trouble in securing not only suitable models, but suitable expressions (two very different things), if it were in his power to purchase and select such photographs as were requisite to his aim. Thus, if called upon to depict hunger or thirst, fatigue or pain, gladness or joy, grief or sorrow, could he but procure artistic photographs of these presentments, his work would not only be facilitated, but likely to have far more of truth in it. No doubt the photographer would find it no easy matter to discover suitable models for his studies, on his part, but to a patient, painstaking student the task would not be very difficult, and he would know that if good models are scarce, his studies would also be both scarce and valuable.

Patent Intelligence.

Applications for Provisional Protection.

7365. WILLIAM HENRY MARSHALL, 12, Westborough, Scarborough, Yorkshire, Watchmaker and Optician, for "Improvements in photographic shutters or caps."—Dated 7th May, 1884.

7552. DUNCAN MACNAUGHTAN, 44, Radner Street, Chelsea, Middlesex, Librarian, WILLIAM SPIERS SIMPSON, 47, Battersea Park Road, Surrey, Mechanician, and GEORGE SMITH, 151, Strand, London, Middlesex, Sadler, for "An improved method of obtaining or reproducing pictures, drawings, and designs, &c., &c."—Dated 10th May, 1884.

7606. DUNCAN CAMPBELL DALLAS, 12, Crane Court, Fleet Street, London, Engraver and Printer, for "Improvements in the production of raised and sunk designs on metal and other suitable surfaces for printing and decorative purposes."—Dated 12th May, 1884.

Specifications Published during the Week.

4557. E. G. BREWER, "Apparatus for touching up photographic pictures, &c."—A Communication from Messrs. J. Geesbergen and La Societe Geruzet Freres.

A description of this invention will be found on page 645 of our volume for 1883.

4705. R. BROWN, R. W. BARNES, and J. BELL, "Obtaining by photography definite photographs to be used in the production of typographic blocks and in the art of photo-lithography and like arts.

Our invention has for its object to produce definite photographs broken up into dots, lines, or grains, so that they can be used in the production of typographic blocks by the art of photo-etching and like arts, and can also be used in the art of photo-lithography and like arts. In the practice of our invention we proceed as follows:—We take what is known as a photographic transparency of the object or picture; we prefer that this transparency shall be as clear a transparency as possible when seen by transmitted light, and such a transparency can be obtained by processes well known in the art of photography. Having obtained such transparency, we place the same upon a lined or hatched background, such as a sheet of white paper having a lined or grained surface, or a stippled cross hatched, or like surface printed, or drawn thereon. Any material having such a lined or stippled surface, or effect, or variety of effect may be used as the background for the transparency. The lining, graining, or stippling of the background may also be varied to suit the picture or object, and its surroundings, so that portions of the background may be lined and portions stippled. Having so backed the transparency, when viewed by reflected light the picture of the object can be fairly seen broken up into dots, lines, or grains of the backing, showing through the half tones and clear parts of the transparent picture when viewed by reflected light. In attaching or fixing on the face of such transparent photographs the lined, grained, or stippled surfaces, or backing before described, we do not always confine ourselves to a single sheet of the said surface or backing containing one design only, but we sometimes make combinations by placing in various parts of the transparent photograph suitably cut out portions of various and differing sheets of lined, dotted, or stippled material, so as to produce a varied and harmonious variety of background suitable to the subject under manipulation. Again, in preparing a suitable backing to combine with the transparent photograph, we prepare the backing by hand, or by mechanical manipulation in an artistic manner best suited to the subject or object. Having so prepared and backed the transparency, we take from the transparency so prepared and backed a definite photograph on paper, glass, gelatine, or other sensitized material. This definite photograph has the photograph of the transparency broken up into lines, dots, or grains by the backing. The definite photograph is thus in a condition to be used in the production of typographic blocks by the art of photo-etching and the like arts, and is also suitable to be used in the art of photo-lithography and like arts. Another method of producing a definite broken up or divided photograph, having dots, lines, or grains according to our invention, consists in covering the sensitive plate in the camera with a material such as net-work, or with a photograph on glass, or other transparent medium, of lines, grains, or stipples, or cross-hatched lines, fine or coarse, according to the nature of the result required. The photograph on the sensitive plate will then be broken up into the dots, lines, or grains, which are photographed simultaneously with the object on the sensitive plate. We thus produce direct a definite photograph broken up and divided into dots, lines, or grains, and in the condition to be used in the production of typographic blocks by the art of photo-etching and the like arts, and also suitable to be used in the art of photo-lithography and like arts. When required, we complete such photograph by hand manipulation, removing, or adding, dark or light portions after the manner known in the art of photography as "retouching." By another method, according to our invention, to produce a typographic block, we proceed as follows:—We take a transparent photograph of the picture, or object, and we take a transparent photograph of grains, lines, or stipples, and we prepare a plate or block of zinc, or other suitable metal, with bitumen or other substance that will give a sensitive surface to the zinc, or other metal. We then place the photograph of the picture or object, and the photograph of the lines, dots, or stipples before spoken of, over the sensitive zinc or other metal, and print by light in the usual way, and thus we produce the picture in dots, grains, or lines upon the surface of the zinc or other metal. We then develop the picture, and subject the plate or block to the process of photo-etching in the usual way. Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, what we claim is—First. The method substantially as herein set forth of producing from half-tone pictures and photographs, photographs to be used in the production of printing surfaces. Second. The method substantially as herein set forth of producing in the camera and direct from an object, photographs to be used in the production of printing surfaces. Third. The method substantially as herein set forth of producing photographs on sensitized surfaces of metal, such as zinc, to be used in the production of printing surfaces.

Patents Granted in America.

297,773. Crosby M. French, Garrettsville, Ohio, "Method of producing ornamental relief borders or foregrounds for photographs." Filed June 4, 1884. (No specimens).

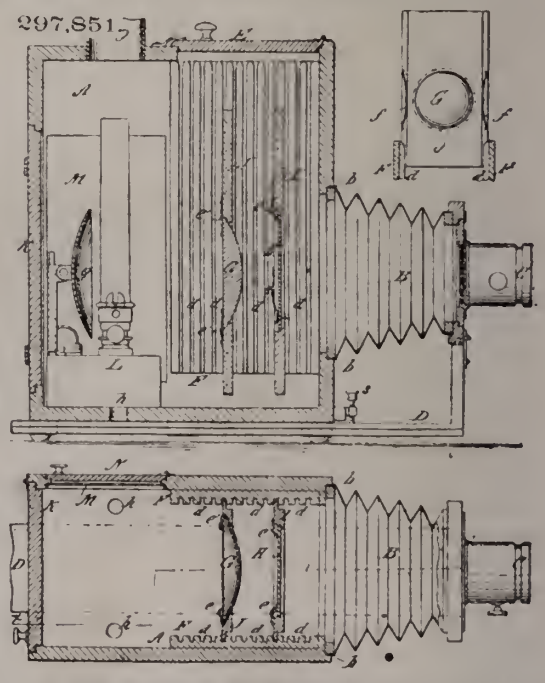
Claim.—The method of producing photograph-borders, consisting in first making a bas-relief border of any desired design, then taking a negative of such design, and finally using this negative in "printing-in," in conjunction with a portrait-negative, as a border substantially as and for the purpose set forth.

297,851. Thomas C. Roche, Brooklyn, assignor to E. and H. T. Anthony and Co., New York, N. Y., "Enlarging-camera." Filed January 30, 1884. (No model).

Claim.—1. In an enlarging-camera adapted to use an artificial light, the camera-box having a lamp and reflector chamber in its rear end, constructed with a series of interior grooves or slideways at or near its forward end, adapted for the reception and adjustment of the condensing and picture slides, and an opening to the grooves to facilitate the adjustment of the slides, said opening being closed by a cover or door, substantially as and for the purposes specified.

2. In an enlarging-camera, the combination, with the box A, having a series of interior grooves, *d d*, near its forward end, of the slide J, fitted with a condensing-lens, the negative or picture slide I, and the bellows B, with its attached lens, essentially as and for the purposes herein described.

3. The slides I J, or either of them, provided with holding-springs at their sides, in combination with the slideways or grooves *d d* in the interior of the sides of the camera-box, essentially as and for the purpose herein set forth.



4. In an enlarging-camera, the box A, having a series of interior slideways in its front end portion, a lid or door for insertion and removal of a lamp and reflector, *g*, within and from its rear portion, one or more air-feeding inlets in its bottom, and a chimney in its top, over the place occupied by the lamp, substantially as specified.

5. The combination, with the box A, having a series of interior slideways or grooves in its forward end portion, for the insertion, removal, and adjustment up or down and toward or from each other of a negative or picture carrying slide and condensing-lens slide, or diffusing-glass, of a lamp and reflector, *g*, in the rear portion of the box, and a front lens or lens-tube in close adjustable connection with the forward end of the box, essentially as described.

6. In an enlarging-camera for operation by artificial light, the camera-box provided with a non-actinic glass in one or both of its sides, at or near its rear end, and constructed to form a lamp-chamber at said end, essentially as and for the purposes specified.

MOLECULAR PHYSICS AND PHOTOGRAPHIC ACTION.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

In the last issue of the NEWS, you had a reference to a publication of mine in the Belgian Photographic Association's *Bulletin*. At my lectures at the Royal Institution I gave an explanation of the subject alluded to, and I think it may be of interest for me to add a few words on the topic. It is well known that if a phosphorescent plate is excited, and then warmed—say, by a flat iron—that an image of this flat iron is shown by increased luminosity at that particular part of the plate to which it has been applied. This is probably due to the fact that the molecules of the body have an increased amplitude of vibration, caused by the externally-applied heat, and that, therefore, the atoms of the molecules of phosphorescent matter (which cause the light-giving radiations to be emitted) have greater play, and, therefore, themselves take up a larger amplitude of vibration when once set in motion, which is shown by an increase in the luminosity body. From this point I started my enquiry. What is true of one kind of matter, ought to be true for another. Take a gelatine bromide plate, and press against the back surface a hot flat iron, and examine the film by reflected daylight. It will be seen that the colour of the sensitive salt is altered, becoming deeper orange. On the plate cooling, the film resumes its normal colour. Place iodide of silver in an intense cold, such as produced by carbonic acid snow, and ether, and the iodide will be found to have a grey colour, quite different to that it has at a normal temperature. Such changes of colour mean something, and that "something" ought to show itself when exposing these sensitive compounds.

If a gelatine plate be warmed at the back by an iron, and then be exposed to light whilst still hot, an image of the iron is produced on development, shown by increased density at that part. In some plates, so brief an exposure to match-light was given that whilst the image of the iron was fully developed, the parts outside were very nearly unacted upon. This is the case, whether the plate be developed immediately, or be allowed to cool; hence has no connection with warm developing solutions. If the plate be heated and then cooled, and then exposed to light, no action is visible. This is what would be expected. The heat gives the molecules greater amplitude of vibration, and therefore the atoms are more free to swing, and can attain to that amplitude more rapidly, which is necessary for the throwing off of the bromine or iodine; *hence we have heat causing greater sensitiveness*. Now other experiments suggested themselves, viz., with collodion and paper. A collodion emulsion plate was taken and dried, and the iron pressed against its back, and on development the very reverse of what took place with a gelatine plate exhibited itself, viz., the heated part seemed less sensitive. Here was a crux. The theory seemed to fail. Another experiment settled this, however. A plate was coated and washed, and one half placed in boiling water, and whilst still warm the plate was exposed, with the result that the heated portion behaved like the gelatine plate. The cause of the difference of behaviour in the last used plates was evident. It was a matter of moisture only. Now a collodion dry plate, if thoroughly desiccated, is insensitive; it requires moisture to enable the liberated halogen to be taken up, and this is the case whether a preservative be used or not. With the first plate the hot iron had expelled the moisture, leaving that part less sensitive, owing to the absence of a halogen absorbent. In the last plate, where moisture was equally present, the effect of heat manifested itself. In a gelatine plate which is colloidal, it is almost impossible to get rid of the last traces of moisture, except by a prolonged sojourn in a dry place; the short time during which the heat acted rendered no essential difference in the amount of moisture present. The same was the case with paper.

In trying the sensitometer on a heated plate I found a marked increase in sensitiveness, such increase in sensitiveness disappearing when the exposure took place after the plate had cooled. The phosphorescent plate of the sensitometer, and also sensitive plates, were heated to the same temperature, and exposures made, with the result that the sensitive plate *seemed less sensitive* than at ordinary temperatures. For instance, in one case, a 22 plate only registered 15. This is due to the fact that the heated phosphorescent tablet after exposure loses its luminosity very rapidly, and that after a lapse of a minute, as is usual in sensitometer experiments, the increase of sensitiveness of the warmed plate does not make up for this loss. By warming a plate which read ordinary 18 on the sensitometer, I have on one occasion got a reading of 24.

A set of experiments with temperatures of melting ice have also been carried out with results corresponding to the above, viz., cold diminishes sensitiveness by causing the amplitude of vibration of the molecules to be obstructed. I hold that in the region of molecular physics, the above experiments are important and conclusive. If the matter be considered, it will be seen that the sole connection between phosphorescence and the sensitive salt is that of the increase of the molecular and atomic vibrations, and not that the sensitive salt itself is phosphorescent. Facts are against this, as can be experimentally shown, whilst by the theories in molecular physics, the phenomena are quite accounted for.

Correspondence.

NEW COATING MACHINE.

DEAR SIR,—Several weeks ago, Mr. A. L. Henderson spoke at one of the Society meetings of a new coating machine that he had invented, and which he promised shortly to give to the public; and I presume many others besides myself have been waiting anxiously for a description of it. The season of plate-making is upon us: will not Mr. Henderson come to our aid ere it is too late?—I am, yours, &c., ANXIOUS.

Troy, N.Y., U.S.A.

INFLUENCE OF TEMPERATURE ON SENSITIVENESS.

DEAR SIR,—In reference to a paragraph in your "Notes" this week, page 297, speaking about Captain Abney's contribution to the *Bulletin Belge*, I may observe that I wrote an article, which appears in the YEAR-BOOK for 1884, page 41, in which the subject is introduced. For a long time I have observed the conditions of temperature affecting the gelatine plate, and the experience I record there would be worth a Jew's eye to many a photographer who does not change his formulæ with the changing weather. While my pyro always remains the same, my ammonia and bromide are varied to suit the temperature of each succeeding day.—Yours truly, J. H. KILLICK.

MATT PICTURES ON ALBUMENIZED PAPER.—PHOTOGRAPHY IN MELBOURNE.

DEAR SIR,—Your article "Matt Pictures on Albumenized Paper," in last week's number, loses sight of the best and simplest method of producing them. The gloss is easily removed by rubbing finely-powdered pumice stone over the finished picture with a soft india-rubber pad, leaving a perfect and pleasing matt picture.

In reference also to an article on "Photography in Melbourne" in the same number, I have the pleasure to inform you that four different albums of New Zealand scenery photographs are now in actual course of preparation by the firm alluded to, viz., Messrs. Burton Brothers, of

Dunedin. The photographs of scenery are exquisite in the extreme, and these beautiful little works will certainly attract many European tourists to this, as yet, comparatively unknown "land of loveliness." These albums will be ready during the current year, and will be then announced in your advertising columns.—I am, dear sir, yours obediently,

F. Parsons.

[Is it not much easier to merely use a different sensitizing bath than to roughen the prints afterwards? Still the method mentioned by our correspondent is likely to be useful.—Ed. P.N.]

THE PROPOSED AMALGAMATION OF THE LONDON PHOTOGRAPHIC ASSOCIATIONS.

Sir,—I heartily endorse nearly all Mr. Cobb's and "A Member of Them All's" objections to the numerous so-called clubs and societies; but the most serious loss of all is time, for I do not like to lose anything, and it behoves me (if I want to keep pace with the times) to attend every meeting—that is, all that will receive me.

At the close of the Brittlebank meetings a few years ago, I offered a sum of money to start a club proper, provided a like amount was subscribed or guaranteed collectively. The amount named was reached, but no efforts were made to supplement these guarantees, or organize a proper club, beyond having a weekly meeting at an hotel.

These club meetings were not too harmonious, and the result was a kind of split, and subsequent formation of the London and Provincial Photographic Association (as much a club as the other society called by that name).

Some gentlemen, whom for the nonce I will call the upper ten, sneer and treat with contempt others who, by force of circumstances, have not been born with silver spoons in their mouths.

I confess I cannot see how (so long as cliquism prevails) the difficulty is to be overcome, unless we are to have an Upper House and a Lower House. For my part, I would rather sit on the cross-benches, or, if need be for the good of the cause, become a Bradlaugh.

Leaving joking aside, the time has now come when a permanent club might be established. The existing little circles may have their talk *in camerâ*, and those that are not ashamed of propounding their theories before the whole world, "can have their chiel amang them takin' notes." I for one, whether admitted into the upper or lower house, will not be backward in coming forward.—I remain, yours, &c.,

A. L. Henderson.

Proceedings of Societies.

Photographic Society of Great Britain.

The ordinary meeting of this Society was held on Tuesday, the 13th inst., at the Gallery, 5A, Pall Mall East, James Glaisher, Esq., F.R.A.S., in the chair.

The minutes of the previous meeting having been read and confirmed, Mr. Samuel H. Salmon was elected a member of the Society.

The Chairman: Since we last met, the death of our old friend, the Rev. F. F. Statham, has occurred. For twenty-five years he presided over the South London Photographic Society. During that long period, all who came in contact with him were familiar with his kindly manner, and the able way in which he advanced the interests of that Society. Painful as that intelligence was to me, yesterday I experienced another shock, too painful to describe in words to-night. On opening a letter, I was startled with these words: "You will grieve to learn that Mr. H. Baden Pritchard is no more." Our dear friend, who, for twenty years as member, councillor, and vice-president, has done so much work for our Society. Few men have gathered round them such a large circle of friends as he has done, and none are better acquainted with his kind and genial qualities, or will miss him more, than the members of this Society. The Council have decided to send a letter of condolence to the widow; perhaps, in addition, the members might like to add something to what has been already said.

Mr. A. Cowan said, in addition to the words expressed by the Chairman, he should move that a floral wreath be sent before the funeral takes place, as a tribute to the family of the Society's esteem for the memory of their lamented friend.

Mr. W. S. Bird, in seconding the motion, said the feelings expressed by Mr. Cowan harmonized with his own; the wreath should be sent by the whole of the members of the Society, not the Council only.

The vote being carried by acclamation, the Chairman called upon Mr. John Spiller, F.C.S., to read his paper, "Observations on Fading."

Mr. Spiller commenced by saying that a good deal had been written and said on the subject of fading at different times, and no new light appeared to be thrown on the subject by the discussions which have recently taken place. Mr. E. Dunmore recently read a paper on "Old Photographs" before the South London Photographic Society, in which there were some points which induced him to re-open the subject. Some years ago he (Mr. Spiller) made numerous experiments in this direction, the results being published at the time. From enquiries recently made he found that the principles then enunciated are tolerably well carried out now. For instance, very much more care is taken with the washing before and after fixing than was usually the case a few years ago. Toning and fixing solutions are newly made, instead of being used over and over again. Another thing, negatives are not left too thin. In short, his enquiries tended to show that the suggestions then made are well observed. Having exhausted the chemical and manipulative portion, his attention was turned to the paper makers, at whose mercy we were, in a great measure, placed. Numerous samples of mounts were collected, many of which undoubtedly contained hyposulphite of soda or one of the chlorides—generally lime. Some sixteen years ago he wrote an article in the Photographic News, which the Society did him the honour to reproduce in their own Journal, and it would be remembered by many present that the causes of fading were pretty well gone into. As the subject is again well to the front, he considered it a fit time to say something more about it, with the hope that the remaining causes of fading would be discovered, so that it would never trouble them again. Mr. Spiller then read an extract from the *Journal of Chemical Industry*, having reference to recent investigations into the behaviour of a large series of sulphites and bi-sulphites of the alkaline earths, and their reactions on the alkaline chlorides used in bleaching; some of these compounds being here shown, the magnesic bi-sulphite being especially recommended for this purpose. Attention was also called to the suitability of a paper pulp made from wood fibre, either alone or mixed. Mr. Spiller then read an extract from the specification of Ainsley Cooke, 1852, in which the hyposulphites of lime, soda, and potash were mentioned, these being included in the practice of the present day. Other extracts were quoted, one dating back as far as 1846, wherein sulphurous acid was mentioned. Mr. Spiller said if the paper makers would employ sulphite of soda instead of the hyposulphite, no danger would arise. As a proof, he had submitted two photographs cut in halves to the action of both salts. The solution of sulphite of soda had no appreciable effect on the print after forty-eight hours' immersion, while the portion in hyposulphite of soda was badly bleached or faded. A well-cleaned silver coin was placed in the sulphite solution, and no indication of silver was found on testing for that metal; but a similar coin placed in the hyposulphite solution gave strong indications of the silver being dissolved. He (Mr. Spiller) considered this experiment furnishes an answer to that portion of Mr. Dunmore's paper published on page 170 of our present volume, where he says that a twenty per cent. solution of hyposulphite of soda applied to and left in the prints has no effect whatever on their permanency. Mr. Spiller had frequently found soluble chlorides in samples of cheap mounts, but never free chlorine. In the event of sulphite being used by paper makers, the usual iodide of starch test would no longer serve, as sulphite affects it. We have a ready means of determining the presence of sulphite by means of a weak magenta solution; hyposulphites do not affect this colour, therefore it should be the paper-maker's guide. In the Journal of the Society of Chemical Industry, Messrs. Giles and Shearer have worked out this method to an absolutely reliable standard. Mr. Valentine Blanchard, in the current Year-Book (page 77) speaks of prints mounted on a lithographed tint being more permanent than on ordinary white mounts; no doubt the thin layer of a greasy

substance protects the print. An additional security is also found in the use of an eucanstic paste, thus shutting out the influence of the atmosphere in a measure. It is stated that paper makers in Germany and Scotland have given up the use of hyposulphite of soda; if it were generally adopted, photographers would hear that this fertile source of fading had been banished for ever. Mr. Spiller then placed some dilute rosaniline salt in two tubes, adding sulphite of soda to one, and hyposulphite to the other; in the former case, the colour was instantly discharged; in the latter, no alteration took place.

The Chairman enquired if there were any remarks?

Mr. Giles said there was a good deal of sulphite to be met with in the market as hyposulphite; possibly in Mr. Dunmore's case, alluded to by Mr. Spiller, he may have come across a sample of it.

Mr. E. Dunmore: If Mr. Spiller had gone a little further, and left the hypo in as he had suggested, a different result might have been obtained. He was not alone in the experience mentioned; others had done the same. If prints are kept in hypo some time, there is not the slightest doubt but they will fade.

Captain Abney remembered Mr. Spiller's earlier experiments, which had refereuce to a different form of fading, viz., a yellowing in the lights. He (Capt. Abney) thought there was more to fear from organic compounds than from hyposulphite. Mr. Spiller recommended the fixing bath being kept alkaline, and fading seemed to be worse since that time.

Mr. J. R. Sawyer made some prints from waxed paper negatives about thirty years ago; he used an eighty-grain silver bath to float his albumen paper on, and toned with hypo and gold; these are in perfect condition now.

Mr. T. Sebastian Davis found that deep printing in sunlight, and with gold toning—not sulphur toning—is satisfactory. Sulphur toniug must lead to fading sooner or later.

Mr. T. Brownrigg said the oldest prints he had, which had kept well, were taken out of the frame, placed in hypo to which silver had been added, and toned afterwards.

Col. Stuart Wortley, when in Naples some years ago, printed a large number of pictures, which received very little washing; some of these, sent home to the 1862 Exhibition, and mounted here, had faded; others were as good as when first printed.

Mr. W. England remembered the circumstance. The cause of fading was due to dampness in the new Exhibition building. Slovenly washiug has much to do with fadiug, aud bad mountiug boards also.

Mr. Spiller briefly replied to the various speakers.

The Chairman said they were certain to accord Mr. Spiller a warm vote of thanks, for the paper had proved valuable iu many ways. He hoped paper makers would avail themselves of the suggestion to use sulphite in the future. His own experience was that good washing was necessary; some prints he made thirty years ago are good now.

The vote having been accorded,

The Chairman called upon Mr. W. E. Debenham to read his paper on the "Illumination of the Dark-Room."

Mr. Debenham commenced his paper by speaking of the importance of the preservation of the sight, and quoted the opiuious of Mr. W. Acklaud and Dr. G. A. Herschell as to the injurious effect on the eyes of a red light. Whilst there might be some few persons who preferred as a matter of comfort a red to a yellow light, he believed that the great majority found the red light of the dark-room very trying and injurious to the sight, aud would prefer not to use it, if they did not suppose, from what they had been told, that yellow was not so safe for the plate. The use of red light had been introduced and insisted upon because it had been asserted that bromide was proportionately so much more sensitive to the yellow and orange—the middle of the spectrum—than iodide; that the same coloured light proper for working in, with one haloid, was not so with another haloid. In view of the different results obtained by different experimentalists when photographing the spectrum, it is better to rely upon tests made upon colours such as are likely to be used. He produced a sheet of various coloured ribbons, and photographs taken from them with three plates, one containiug bromide only, one with the addition of five per cent. of iodide, and one with ten per cent. The colours all came out in the same series on each plate. This proved, he thought, that the great effect stated to be produced on the colour sensitiveness of plates by the addition of iodide did not, in fact, exist. With reference to Captain Abney's experiments with stained red as compared with canary medium, described at the March meetiug of the Society, it was poiuted out that the glass known as stained red was a silver stained glass of the same material as the yellow, and was only red by virtue of the accumulation of yellow. This was showu by dissolving part of the staiu from a picce by means of fluoric acid, when the colour was seeu to be of a clear yellow. Captain Abney's experiments, however, could not be considered conclusive. The plates ought to have been exposed iu a similar mauner to that iu which the readiug distance was taken. That Captain Abney, moreover, should find less photographic effect through stained red thau through canary medium he could not understand, as he had always found more. Passing on to the use of supplementary screens of different colours, he said that Captain Abney had advised the use of cobalt with staiued red. He therefore showed a lautern, one side glazed with stained red and cobalt, and the other with stained red and green, the latter of which combinatious allowed more than three times as much illuminating power as the other; at the same time, that as a plate exposed and developed before the audience showed, it had far more protective influence from photographic light. This he attributed to the fact that stained red being an accumulation of yellow, allowed that coloured ray to pass, and so did green, whilst the latter assisted by cutting off both ends of the spectrum. A composite whitish light, produced by throwing green and red upon a white screen, was showu, and it was stated that this gave far less photographic effect than an ordinary white light, aud could with some precautions be safely used for developing. The couclusious that he considered established were:—That the great difference in relative sensibility to different colours, stated to exist in the two substances, bromide of silver in gelatiue, and the ordinary bromo-iodide bath plates, does not exist; that, therefore, the difference in the colour of the illuminatiug medium, said to be required, is a mistake; that yellow light gives more luminosity iu proportion to its effects upon the photographic plate, than real red light; that "staiued red" glass owes much of its character to the fact that it is a piling up of yellow; that green glass cuts off both ends of the spectrum, aud therefore, in addition to renderiug the light cooler, is a considerable protection; that green glass used as a supplement to stained red, allows more illumination to pass than cobalt so used, aud is much more strongly protective of the plate by obstructing photographic power. Mr. Debeuham hereupon exposed a plate to burniug magnesium wire transmitted through red glass; also, red with green superposed, and red with cobalt, the latter upon examination beiug far less luminous than with green superposed. This plate was developed in the presence of the meeting; when development was complete, it was shown that the portions exposed to red, also red iu combination with cobalt, had considerable photographic action, whereas, with the combination of green and red, no action took place.

A vote of thanks having been asked for and accorded to Mr. Debenham for his paper,

The Chairman anuounced that, owing to the lateness of the hour, Mr. J. R. Sawyer would defer his paper until the next ordinary meeting. His attention had been called to an Art Loan Exhibition to take place next month at Guildford. Exhibitors were confined to the residents in the county of Surrey. Photographs would be accepted. It was also decided that the discussion on Mr. Debenham's paper should be taken at the next ordinary meeting, to be opened by Mr. C. Ray Woods. It was also announced that the next intermediate meeting will take place on the 27th inst; the next ordinary meeting, June 10th.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 8th inst, Mr. A. Haddon iu the chair.

Mr. A. L. Henderson, referring to old developing solutions, showed a negative developed with pyrogallol three years in solution.

Mr. A. Mackie passed round a flexible tube arranged for releasing shutters by hydraulic pressure, similar to the ordinary pneumatic tube.

The Chairman then called upon Messrs. C. and F. Darker to give their lecturette, "On the Phenomena of Light."

Mr. C. Darker, replying, said it would give them much pleasure to treat the subject as far as time would permit; they rather desired it to be a friendly chat thau the more formal lecture. He said the ancients' ideas of light was very crude: some imagined light was emitted by the objects themselves, others that it originated in the eye. Archimedes must have

known something about light and its action when he made his celebrated concave reflector. One hundred and fifty years ago, Sir Isaac Newton imagined light was caused by minute particles, which were shot out from luminous bodies; this was known as the emission theory. The famous Dutch astronomer, Huyghens, about this time propounded the undulatory theory, so that Newton likened it to a rifle bullet passing through space, and Huyghens to undulations or waves of sound. A scale of the measurement of undulations was then thrown on the screen, and the different conditions of surface necessary to reflect different colours were explained, and by means of the oxy-hydrogen lantern a beam of white light was thrown on to a sheet of paper covered with biniodide of mercury; heating this salt caused an alteration of the surface of the substance to take place; where the crystals formed, the red colour changed to bright yellow; by crushing down the crystals the red colour returned, to again disappear upon the application of heat.

The absence of colour in flowers when seen by monochromatic light was also illustrated.

With regard to the speed at which a beam of light travels, the lecturer said it was estimated, calculating by the eclipse of Jupiter's satellites, to be 192,500 miles per second; this had been somewhat modified since by Foucault, Young, Forbes, and others. It was not a matter of how long it takes to see an object, so much as the time occupied by the optic nerves to convey the fact to the brain. An illustration of this would be seen after they had burnt some magnesium ribbon; black lines would appear on a white screen, which was caused by the nerves being over-wrought. By placing a ruby glass cap over the light, and moving a black object in the red light, the shadow gradually appeared green. By revolving the same object in green light it gradually appeared purple, showing the power of the eye to assimilate itself to circumstances with the complementary colour. Moving circles, rotating dots, and a rotating spectrum were shown, first slowly, afterwards rapidly rotated. The eidoscope came next, some beautiful patterns being obtained; another illustration was the popular chromatrope.

The persistence of vision was next dealt with by means of the revolving wheel, the possibility of seeing the true pattern or different patterns by revolving a flashing shutter in front of the beam of light. The angle of reflection was then shown to be equal to that of incidence, while divergence of a ray was illustrated by means of a convex mirror, and convergence by means of a concave mirror.

The use of the Nicol prism was explained, and the use of the analyser illustrated by passing a ray of light through the prism on to a pyramid, a piece of quartz placed in front of the prism rendering the complementary colours visible. Analysing by small particles was also shown. A tube of water containing mastic in fine division was placed under the ray from the Nicol prism; when intercepted by quartz, the red and green colours were obtained. A cell containing milk and water was shown to act in a similar manner. It was mentioned that towards the close of the day during the summer, the light from the north is so far polarized that the sky may be regarded as forming a very fair polarizer. The polariscope was next dealt with. A ray of light falling on a bundle of (thirteen) glass plates fixed at an angle of abont 56° was shown to be polarised.

In conclusion, a number of objects were shown, including annealed and unannealed glass under pressure, various forms of crystallization, also designs in mica, selenite, &c.

Upon the motion of the Chairman, a hearty vote of thanks was accorded to Messrs. Darker for their interesting lecture.

It was announced that the subject of the next lecturette in June will be "Altering the Density of Negatives," by Mr. W. Coles.

Edinburgh Photographic Society.

The seventh meeting of the current Session was held in 5, St. Andrew Square, on Wednesday evening, 7th of May, Mr. Wm. Neilson presiding.

The minutes of the previous meeting having been passed, Messrs. E. Park, James Melville, Robert Gray, and J. Wilson Stewart were admitted ordinary members of the Society.

The Secretary read a revision of laws as re-arranged by the Council, which will be discussed at next meeting.

Mr. G. G. Mitchell read a paper, "Photographers and Sitters" (see page 311), for which he received a vote of thanks.

Mr. John Annan exhibited a large number of landscapes by Mr. Andrew Pringle, Mr. Hay, the late Mr. Black, and others, amateur and professional. Mr. Annan had collected several sets, each representing the same subject, but by different hands, and was thus able to show great diversity of treatment. From the same point of view and on the same sized plate, one man produced a bold massive composition, while another (perhaps through using a wider angled lens) showed a poor, flat, insignificant result. Another set showed the great diversity of results from very slight modification of point of sight; another set showed prints from the same negative, but cut in different sizes and shapes. In all these examples there was little difficulty in picking out one that stood out distinctly superior to the others, and Mr. Annan pointed out the reasons why, and showed how others had failed. The exhibition possessed high educational value.

A vote of thanks was awarded to Messrs. Annan, Hay, and Pringle, by acclamation.

Packets of hydrokinone were distributed among the members willing to experiment with it and state results at next meeting.

A set of photographs of the characters in the Passion Play at Ober Ammergau was exhibited by Mr. G. G. Mitchell, and excited considerable interest.

A vote of thanks to the President terminated the proceedings.

Bolton Photographic Society.

At the third annual soirée, held in the Baths Assembly Room, there was a large attendance of members and their friends. Round the room were ranged tables filled with specimens of the photographic art, the work of the members, the productions being highly creditable to amateur effort.

Prominent amongst the specimens exhibited were those of Mr. T. Parkinson, a hundred in number, which claimed a large share of attention. One of the finest of these was a view of the interior of Mytton Hall, the residence of Mr. John Hick, J.P., President of the Society; another was a good view, taken by electricity some few years ago, of a group of the members of the Microscopic Society, in the Town Hall; and others, again, portrait and view, were in carbon. Some exceedingly good specimens of photography were shown by Mr. C. K. Dalton, including instantaneous photographs, and one in platinotype. Mr. R. Mercer had some beautiful views, also in platinotype, chiefly of Smithills Hall, which were greatly admired. Mr. J. W. Hawksworth, the energetic secretary of the Society, displayed a few good specimens recently taken, as well as a large view of the Fever Hospital, with the Sanitary Committee in the foreground. Mr. J. R. Bridson, J.P., one of the vice-presidents, displayed some twenty views of Windermere scenery, beautiful in execution and production; and Professor Heaton displayed some pretty views of Swiss scenery. Mr. W. Banks had a few good photographs, and also displayed a quantity of apparatus, &c. Mr. W. Laithwaite had a few good views of Turton Tower, the Jumbles, &c. Mr. E. N. Ashworth had some fine photographic pictures of Scotch and Cumberland scenery, and Haddon Hall, with Dorothy Vernon's door. Mr. B. Abbatt and Mr. J. S. Jackson were also exhibitors, their specimens, though few, being good; and the Rev. J. W. Cundey, M.A., had some excellent photographs of the Italian Alps.

Among the outside specimens were three excellent sea views from the Autotype Company, and a number of splendid photographs produced by Mr. J. B. Wood, a member of the Manchester Photographic Society, who kindly officiated as descriptive lecturer. Mr. J. R. Bridson, one of the vice-presidents, acted as chairman, and congratulated the Society upon its proficiency.

Mr. Hawksworth, Secretary, read the report, which was satisfactory, showing that since last season twenty new members had joined the Society.

The Bolton Glee Party, with Mr. J. Bentley at the pianoforte, enlivened the proceedings by their united efforts.

Notts Photographic Association.

A meeting of this Association was held on Friday, May 9th, at the Morley House, Shakespeare Street, the President in the chair; there was a very good attendance.

The President dwelt on the rise and progress of photography in Nottingham, the difficulties that had been encountered, and the obstacles which had been successfully overcome. He advised the members to study nature as much as they could during the summer in their trips, as the more they studied the more she would reveal herself in her true and interesting character.

Mr. T. Bourne (President of the Nottingham Society of Art),

in moving a vote of thanks to the President for his very interesting and encouraging address, said that the subject of photography was an interesting one which could not be exhaustively dealt with in one paper, and the degree of excellence which was arrived at had not been brought about by one, two, or three men, but by a little army of workers. He might say he was the principal founder of the old Nottingham Photographic Society, which had been in existence twenty-five years ago, he believed. It had died a natural death through the removal of one and another, and he heartily wished the present Association great success. After alluding to his connection with the Fothergill process, he said that beautiful as this process was, it is now slumbering as a process of the past, having given way to its rival the gelatine bromide plates.

The motion having been carried, the members proceeded to the examination of the apparatus &c., after which the proceedings terminated.

Halifax Photographic Club.

The usual monthly meeting was held on the 7th inst., the Rev. W. E. Hancock, M.A., in the chair.

The President, Mr. Thos. Birtwhistle, gave a practical demonstration of the platinotype process, developing a large number of prints before the audience, the great simplicity of all the operations and beauty of results being highly appreciated. The majority of the Club, however, expressed themselves as not altogether pleased with the new sepia tint.

The Rev. W. E. Hancock asked Mr. Williams if he still held the same high opinion of single lenses for landscape purposes.

Mr. Williams always used such when practicable, and preferred one of the longest possible focus; he did not think any modern single lens gave as good definition, depth, and brilliancy, or as pleasing perspective, taken all in all, as that afforded by the old-fashioned and more bulky form in use twenty-five years ago; and never cared to sacrifice *utility to portability*.

The annual trip of the Society was arranged to be held on Midsummer Day next, and the field of operations, Bolton Woods, when a number of prizes will be competed for.

A hearty vote of thanks to Mr. Birtwhistle for his able and interesting demonstration brought the proceedings to a close.

Sheffield Photographic Society.

The usual monthly meeting was held at the Masonic Hall, on Tuesday evening, the 6th of May, Mr. Councillor Firth in the chair.

A very numerous attendance of members and friends assembled in anticipation of seeing the work of the first trip of the season, which took place on Thursday, April 24th, Haddon Hall being again selected for the dry-plate campaign. The day was misty and damp in the early part, and the trees were in some places covered with hoar-frost, but as the party went on their journey and the sun went on his, life and warmth increased, and with them, the zeal of some of the members. Haddon was reached about eleven o'clock. The weather for the first hour was not bright, but cloudy, and the splendid old Hall was overshadowed, so that many of the first pictures of the pile and its surroundings, taken from the meadows, were wanting in contrast, with the exception of one taken by the President, Mr. Firth, who waited and was favoured with a gleam of sunshine which made his picture a brilliant and charming representation of the subject. Mr. W. Dakin produced some charming pictures of the old place; one in particular, of the Dorothy Vernon steps, which was original in selection and well timed in exposure, considering the shady corner they stand in.

Mr. J. Taylor (the Secretary) succeeded in adding to his already valuable and choice selection of Haddon pictures, some splendid 12 by 10 views, from picturesque positions. Mr. Leaman, of Chesterfield, worked two cameras, both in and out of the Hall, with unflagging enthusiasm, taking with him a rich lot of pictures, both in selection, subject, quality, and manipulation. Mr. H. Rawson, in his usual careful manner, selected a few choice bits as stereos and half-plates. Mr. W. B. Hatfield exposed plates on such views as were absent from his collection, and succeeded in winning in the contest for the best picture, with a whole-plate representation of the banquetting hall (interior). Mr. Word showed a lot of very good 7½ by 5 pictures. Mr. Hayball also succeeded in making up a nice and varied selection by availing himself of the lady figures, which were more for studies than representations of the place. Mr. Millward also made good additions to his stock of 10 by 8 pictures. Mr. Foxon found many subjects suitable to his way of producing pictures, he having a choice for bits suitable for enlarging.

On this trip there was a good attendance of new members, all amateurs. In all there were 17 cameras at work, and 112 plates exposed of various sizes, and 56 finished prints shown at the meeting.

The next trip will be to Dovedale, on the 22nd inst.

The subject for the competition picture for next meeting was announced to be "A Rustic Bridge." Two prizes will be given.

Mr. J. Charlesworth was elected a member.

Talk in the Studio.

Royal Cornwall Polytechnic Society.—The fifty-second Annual Exhibition will open at the Polytechnic Hall, Falmouth, on Tuesday, August 12th, 1884. These are the regulations regarding the competition in photography:—In all cases state whether the work is professional or amateur, and name process of production. All works sent for competition must have been executed within eighteen months of the date of this Exhibition. Carte-de-visite portraits are excluded from exhibition, except when illustrating some special process or novelty. *Professional Photographers*—Medals are offered by the Society for meritorious productions in the following subjects:—1, Landscapes; 2, Portraits; 3, Composition Pictures; 4, Instantaneous Pictures; 5, Interiors; 6, Transparencies for Lantern or Window Decoration; 7, Pictures by improved processes; 8, Enlargements. All enlargements for competition must be the work of the exhibitor. *Amateurs*—Medals are offered for meritorious productions in this department. *Photographic Appliances*—Medals are offered for improved apparatus and appliances, including magic lantern apparatus, &c. All exhibits in this department must be accompanied by a written explanation of their specialities. Exhibits to be sent in not later than August 5th, and further information respecting the photographic department may be obtained from Mr. W. Brooks, Laurel Villa, Wray Park, Reigate.

The Society of Amateur Photographers of New York.—The President, Mr. F. C. Beach, writes:—"I am pleased to inform you that we have just organized a new Amateur Photographic Society for this city and vicinity, of which I am President. Our aim is to provide meetings in which information shall be given by practical demonstrations. We purpose to fit up a hall with suitable appliances for photographic experiments. We also desire to open correspondence with photographic societies abroad, and establish a system of exchange of pictures. We shall have a very complete photographic library."

The Surrey Art Loan Exhibition.—Arrangements are being made for holding a country Exhibition at Guildford Town and Borough Hall, in June, many Royal and titled persons being among the supporters, and it is expected that it will open on the 14th. Objects of art which are in the possession of residents in the country, or which have originated in Surrey, will form the main feature of the Exhibition; but specimens illustrative of the natural history or geology of the county will also be admitted. The only photographs which can be accepted are pictures illustrative of Surrey scenery which have been taken by residents. Mr. T. M. Brownrigg is the Secretary, and communications should be addressed to him at the Town Hall, Guildford. Exhibits must be sent in before the third of June.

A Competition for Photo-Cyclists.—Arrangements have been made for a "Cyclist" camp at the Alexandra Palace during the Whitsun Holidays (May 30 to June 3), and it is proposed that amateur photo-cyclists shall compete for two prizes, value £2 2s., one for the best view of the camp, and the other for the best instantaneous view of machines in motion. A similar competition is to be arranged for professional photographers. Rules may be obtained from Mr. L. A. Edwards, Secretary, 28, Southampton Street, Strand.

The Artificial Light of the Future.—Professor Mathieu Williams, writing in the *Gentlemen's Magazine*, says:—"My note on this subject last July was preceded by one on the researches of Professor Radziszewski. I learn now that he has actually separated

the luminous matter of the *Pelagia noctilnca*, one of the multitude of species of marine animals that appear like little lumps of jelly, and produce the phosphorescence of the sea. He evaporated to dryness 180 specimens, and from the dry residue dissolved out by means of ether a peculiar kind of fat, which, mixed with potassa, gives out, when shaken, phosphorescent flashes. This is exactly what happens to the living animal. When quiescent it is not luminous, and if shaken or rubbed it flashes. I have collected and examined a great variety of these animals at different times; the most remarkable occasion being one morning after a magnificent display of marine luminosity in the Mediterranean, a few miles off the shores of Algiers. The surface of the sea was encrusted, I might almost say, with countless millions of small jelly-like creatures, of spherical, ovoid, oblong, dumb-bell, and other shapes, varying in size from a mustard-seed to a pea; a bucketful of water taken over the ship's side appeared like sago broth. They were all internally dotted with a multitude of what I suppose to be germs, that would be liberated on the death and decay of the parent. The practical importance which I attach to the study of the luminosity of these creatures is the fact that they supply light without heat. The costliness of all our present methods of artificial illumination is due to the fact that we waste a largely disproportionate amount of energy in producing heat as well as light. This wastefulness may be illustrated by supposing that we obtain a pound of the phosphorescent fat of the noctilnea, and divide it into two equal halves, making one-half into candles to burn in the ordinary manner, and using the other half to give out its light by cold phosphorescence. I am not able to give precise figures, but believe that I am well within the truth in estimating that the candle would dissipate 95 per cent. of the potential energy of the fat in the form of heat, giving but 5 per cent. of the amount of light that the other half-pound would emit as cool phosphorescence. Let us, then, hope that Professor Radziszewski will continue his researches, and discover the whole secret of both the analysis and synthesis of this fat, and that of the glow-worms, fire-flies, &c. Now that we can supply the confectioner with the flavours of almonds, raspberries, jargonal pears, nectarines, &c., and imitate the perfumer and the richest colours of nature's sweetest and brighest flowers, all by the chemical manipulation of coal tar, we need not despair of solving the chemical problem of transforming mutton suet or palm oil or vaseline into glow-worm or noctiluca fat, to be used for illuminating purposes.

Photographic Club.—At the next meeting of this Club, on May 21, the subject for discussion will be "Relative Merits of Boiled Emulsion and Ammonia Nitrate Ones." Saturday afternoon outing—Watford to Grove Mill, finish at Essex Arms, Watford.

To Correspondents.

*** We cannot undertake to return rejected communications.

Non-Chemist.—In your case you had better put a piece of copper into the solution, and this will cause the whole of the silver to be precipitated or deposited as a greyish powder. When the copper ceases to cause the deposition of more silver, stir the powder (silver) up with hot water, then allow it to settle, and pour off the liquid. This washing should be repeated once or twice, after which a little ammonia is poured on the silver to dissolve the last traces of copper. Once more wash the silver, and then redissolve in nitric acid.

W. A. C.—1. Mischief is very likely to happen, in consequence of the concentration of the small quantity of hyposulphite solution left in the film. 2. In consequence of the different systems adopted in the manufacture, and the various views held as to the amount of profit which should result. Perhaps, as a general rule, we may conclude that the highest priced plates are the best; but of course there are exceptions. 3. Select either the first or the third. There is nothing to choose between them, and no other objective would be better adapted to your requirements.

Sam. Jutsun.—Nothing which has been published is equal, both as regards completeness and reliability, to the articles on the subject which Major Waterhouse has recently contributed to the pages of the Photographic News.

W. J. W. S.—It will doubtless answer your purpose very well, but probably will not prove quite so convenient as the much more expensive set of lenses which it is intended that it should replace.

G. W. Hall.—It is strange that you should have had such an unfortunate experience of camera makers, and as you conclude that all those who advertise are incompetent, we can only advise you to consult the London Directory with a view of finding out any others who may be in the business.

The Photographer of the Boat-Races at Oxford.—We do not think Mr. Brooks referred to your pictures; indeed, we have reason to think he did not, as if he had seen the pictures you send us, he would hardly have written as he did. Indeed, as you yourself point out, his description does not correspond with the pictures. What do you wish us to do with the pictures?

Topsail.—When we have met with a similar difficulty to that you describe, we always found it advantageous to fume the paper. It may also be advisable to add a small quantity of ammonia to the last water used to rinse away the free silver previously to toning, say a dozen drops to each pint. The smell does not, perhaps, signify much, but we should certainly prefer to use paper which does not possess an unpleasant odour.

Ruby.—Let the objective of the camera look into the instrument just as the eye looks into it; but we hardly think that you will obtain the result you require without a more expensive art rangement.

C. Banyard.—A portrait combination having an equivalent focus of about twelve inches will serve well.

Y. T.—It is by no means advisable to use zinc trays, although cases may occur in which no mischief occurs.

F. H. W.—The best book for you is Fownes' Chemistry, published by Churchill; the cost is, we think, rather under the sum you mention.

Hugo.—See an article which appeared on page 226 of the present volume.

J. Dyment.—1. We can hardly judge without seeing a specimen; but from what you say we are inclined to think the fault must be in the plates. 2. Here, again, we should require to knew more before giving a decided opinion. 3. Probably some hyposulphite remained in it.

G. M.—1. The only way is to make as perfect a copy as possible, let us suppose by contact printing on a gelatino-bromide plate. From this you can make a reproduced negative. 2. A difficult problem, but we have seen this kind of thing done very successfully by the local application of cyanide of potassium solution thickened with gum. 3. Considerably less, perhaps one-fifth.

J. Jobson.—1. We believe it costs one shilling, and it can be had on the premises. If you send the amount to the Secretary, no doubt it will be posted to you. 2. Roscoe's Elementary Chemistry would perhaps not contain as much as you require, so you might obtain Fownes', published by Churchill. 3. The *Chemical News* is a weekly publication, which would doubtless suit you.

W. Kent.—Full working details of an excellent method will be found on page 161 of our present volume. See also page 210.

The Photographic News Registry.

Employment Wanted.

Retoucher, 25s. weekly.—Miss H., c/o Mr. Kent, 49, Newman-st., W.C.
Gen. Assist, 16s. weekly.—L., c/o. Mr. Kent, 49, Newman-st., W.C.
Mounter, Retoucher, Finisher.—E. R., 4, Offley-rd., Brixton-rd.
Reception-Room in first-class house.—Sophy, *Photo. News* Office.
Printer & Toner, first-class.—T. Cook, 20, Bromhead-st., Commercial-rd., E.
Operator, good at landscapes.—Mercury, 3½, Queen-st., Soho.
Col. & Ret. (lady).—F. W., 24, Fairview-ter., Milford Manor, Salisbury.
Italian Operator, speaks English & French.—Spagliardi, 20, Grove-la., S.E.
Retoucher (young lady).—E. F., 92, City-rd., E.C.
Reception-Room or Shop.—L. A., 77, City-rd., E.C.
Retoucher (lady), Lond. or near.—H. M. A., 45, Rye-hill-pk. Peckham.
Spot. & Mounter, Recept.-Room.—Miss Smedley, 45, Gt. North-ter., Linc.
Printer & Toner.—F. K., 40, Brooksty-st., Liverpool-rd, N.
Reception-Room, Correspondent, &c.—A. J., 6, Marlbro'-st., W.
Printer, Toner, Vignetter, &c.—Carbon, *Photo. News* Office.
Printer, generally useful (age 19).—Eunieles, Eton, Bucks.
Assistant Operator, Printer, Toner, &c.—Pyro, 38, Union-st., Birmingham.
Reception-Room, Mounting, Spotting.—49, Brecknock-rd.
Operator & Retoucher, German.—L. Welter, 66, Killigrew-st., Falmouth.
Gen. Assist. (engineer).—J. W. Pateman, 60, Trent-st., Gainsboro', Linc.
Operator, wet and dry.—C. O., 25, Duke-st., Bloomsbury-sq.

Employment Offered.

General Assistant, to retouch, finish, &c.—T. Price, Jersey
Printer, Toner, Vignetter, &c.—T. Moss, 199, Derby-st., Bolton.
Person to Mount and Spot Cards, &c.—Lafosse, Knolls House, Manchester.
Retoucher, and assist in Reception-Room.—Artist, *Photo. News* Office.
Operator, to take entire charge.—Cobb & Son, Woolwich.
Printer, Vignetter, routine of print.-room.—Lafosse, Knolls House, Manch.
Operator for N. of England.—A. & G. Taylor, 70, Queen Victoria-st., E.C.
Gentleman of experience, for City warehouse.—H., *Photo. News* Office.
Printer, perm. to good man.—Benedetti, adjoining Peckham Station.
Coaters, (several).—J. D. England, 21, Charles-st., Notting-hill.
Operator, to take charge.—W. A. S., c/o Marion & Co., Soho-sq.
Lad, as General Assistant.—W. McLean, Hunstanton, Norfolk.
Apprentice in all branches.—Studio, 34, High-st., West End, Sittingbourne
Reception-Room & Retoucher.—Russell & Sons, 49, Brecknock-rd., N.W
Retoucher, to assist in reception room.—Artist, *Photo. News* Office.
Retoucher, male or female.—M., *Photo. News* Office.
Operator, experienced—63, Darlington Street, Wolverhampton.
Spotter & Finisher (Lady).—63, Darlington Street, Wolverhampton.
General Assistant.—W. S. Laroche, 43, Mostyn Street, Llandudno.
Young Man, assist in print., &c.—W. S. Laroche, 43, Mostyn-st., Llandudno.
Oper. & Retouch.; Ferro. pref.—G. Threadwell, 288, High-st. Stratford E.
Photographer for studio on the beach.—T. Sutcliffe, Dovercourt, Essex.
Operator & Retouch. (first-class).—Long & Co., Wellington-st., Woolwich.

THE PHOTOGRAPHIC NEWS.

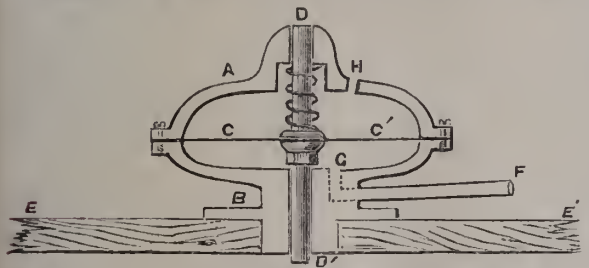
VOL. XXVIII. No. 1342.—*May* 23, 1884.

CONTENTS.

PANCOAST'S PNEUMATIC RELEASE FOR THE INSTANTANEOUS SHUTTER.

OUR readers will remember the original pneumatic shutter which was patented by Mr. Cadett, in which a flap was lifted by a small air motor, and we may here refer to an ingenious instrument of a somewhat analogous character invented by Mr. Spink—this latter being described on page 321 of our volume for 1882. Everyday experience, however, has proved that a pneumatic release is far more generally useful than a pneumatic go and return shutter, and we have seen several ingenious arrangements which have been devised, not only by Mr. Cadett, but also by others, for releasing the drop or spring shutter. In most of these, however, a small balloon or bag of india-rubber lifts a lever by its expansion, and thus withdraws the detent which holds the shutter in its position; but we have now an opportunity of describing an apparatus which seems to offer notable advantages over any pneumatic release that we have seen, insomuch as a simple disc or sheet of rubber is used as the elastic portion, and it is of course easy to replace this in any civilised part of the world; moreover, the rubber is so completely protected from the light as to be but little subject to decay on this score.

Mr. Pancoast's pneumatic release consists of two nearly hemispherical casings of brass, A and B, in the subjoined



diagram, these being bolted together by set screws as shown; but between these is clamped a disc of soft rubber, CC'. A spindle, DD', which passes axially through the whole system, and works tolerably freely in its bearings, grips this disc in its centre by means of a pair of adjustable nuts, like the setting of a circular saw; but the light spiral spring shown in the upper part of the diagram tends to hold the spindle down in the position indicated in the drawing.

To the projecting tube, F, is attached one end of a rubber tube, to the other extremity of which is fitted an ordinary elastic ball or small enema bottle. When this elastic ball is compressed, the air entering the lower compartment by the part G, lifts the diaphraghm and central spindle, and as EE is supposed to be the main board of the shutter frame, the withdrawal of the terminal, D, serves to release the drop or moving part of the shutter. The hole, H, serves to allow of the free escape of air from the upper compartment, or the escape may be provided for by channelling the upper bearing at D. As regards the lower bearing at D', it might be at first sight supposed that very high class and expensive work would be required to ensure a sufficiently accurate fit; but this is not the case, as, if ordinary straight drawn wire be taken for the spindle, it will be sufficient to merely drill out the bearing-hole with a twist-drill.

Mr. Pancoast has proved the value of the pneumatic release by the good service it has rendered him during his recent tour in India. Some details of an earlier and less complete form of Mr. Pancoast's apparatus will be found on page 396 of our volume for 1882.

MR. DEBENHAM'S PAPER ON DARK-ROOM ILLUMINATION.

IT was Mr. W. E. Debenham who recently re-opened the discussion on the subject of the best colour of light for use in the so-called "dark-room," and for this reason his paper on the subject recently read at the Parent Society was looked forward to with considerable interest. The subject of the paper was one which was thought to have been so thoroughly threshed out that no more could be said on it. Nevertheless, the interest which is taken in the matter is such that photographers on the Continent, and on the other side of the Atlantic even, have taken it up, and seem to find that there is something yet to learn.

Putting aside for the present all questions of the particular colour of light which Mr. Debenham proposes to adopt, we may say that if he has done nothing more than to point out the fallacy of the reasoning common among photographers, that, because the red of the spectrum of the sun's light gives the least photographic effect on a gelatine plate, therefore this colour is the best for illuminating the "dark-room," and will be the safest; he has done much.

As a matter of fact, the rays of the spectrum which have the least photographic effect, and the colour of light which (allowing us to see what we are doing whilst developing plates, &c) will give the least photographic effect, have not of necessity any connection whatsoever.

This may be made evident in the form of a *reductio ad absurdum* by arguing as follows.

The ultra red (dark) rays of the spectrum have the least effect of any on a gelatino-bromide film; therefore the ultra red (dark) rays will be the best with which to illuminate the dark-room—which is absurd.

As to the particular shade of yellow light (whether obtained by the use of yellow paper and green glass, or other-

wise) which Mr. Debenham recommended, he appeared to us to fail to make out a case in its favour as against light filtered through "stained red" glass, except on the ground that red colour is hurtful to the eyesight. This latter statement appears to be scarcely proved, and it appears difficult to prove it if we take into consideration how common idiosyncracy is in the matter of the effect produced by the different colours on the eyes. Thus we can say that we do know some persons to whom a red coloured light is emphatically painful, even at times intolerable, and with whom the pain increases as the light does, thus showing that it is not produced by the straining of the eyes in a feeble light. Before this fact had any weight in the matter, however, it would be necessary to show that there are not others who find other colours—for example, blue or green—painful.

Mr. Debenham pointed out a fact with regard to stained red, apparently not generally known, namely, that this colour is in reality built up of a sufficient thickness of yellow merely.

As a matter of fact, the colour which is in "stained lemon," "stained orange," and "stained red" glass is precisely the same. It is only a question of the thickness of the film. Even in the case of stained red it is shown by the spectroscope that a large amount of yellow passes, and in fact the colour is, as we mentioned some little time ago, more of the nature of an orange than of a red.

One thing of real use which Mr. Debenham proved at the meeting of the Parent Society by the actual development of a plate is, that the light got from a combination of red stained and cobalt glass is very much less safe than one got by a combination of red stained glass and green glass, equal visual amounts of light being allowed to pass in each case.

An experiment which must have been new and interesting to many, was that in which red and green lights were combined to make white light. It is well-known that by the addition to each other of lights of any two complementary colours, white light may be produced. The two complementary colours which are the nearest possible to the low refrangible end of the spectrum are a certain shade of red and a certain shade of green. Mr. Debenham had lamps fitted with chimneys possessing colours as nearly as possible to those particular shades; and by receiving the rays on the white reflectors, whence they were thrown on to a screen of white tissue paper, a nearly white light was got. To those who have never seen the experiment it is difficult to believe how like the light from an ordinary candle appears to that got by the addition of the bright green light to the bright red light.

It is very necessary, when considering this experiment, to remember that the light got by combining the two reflected colours will be very different in its action on a photographic film from that got by filtering light first through green, then through red glass, or *vice versa*. The difference is, in fact, almost precisely that which exists between addition and subtraction. In the light got by combining red and green lights, there is present all rays which are allowed to pass through either of the coloured glasses. In the light got by filtering through red glass and then green, there are present only those rays which will pass both the glasses; which, in fact, are common to both the colours. As in the case of the green there is present a considerable quantity of blue light, we could not expect to get a white light very safe for photographic purposes in the manner which we have described. Nevertheless, the difference in photographic power between such a light and one quite similar to the eye, but coming unfiltered from a candle or lamp flame, is very remarkable.

A sensitive plate exposed to the white light composed of red and green, at such a distance as would enable small print to be read, showed only the very faintest trace of fog after one minute's exposure, whilst a similar plate exposed to apparently similar light, obtained from a lamp direct, gave a dense image in the same time. Probably we should not be far wrong in stating the ratio of the photographic powers of the two lights as one to ten.

It will thus be seen that there is nothing impossible, or even difficult, if reasonable care be taken, in using white light in the dark room. The discussion on Mr. Debenham's paper which is to take place at the next meeting of the Parent Society will be looked forward to with interest.

AMMONIA: ITS COMPOSITION AND USES.

BY W. M. ASHMAN.

Probably next in importance to silver haloids among the chemicals employed by the photographer, may be classed that universally known substance ammonia, for by its aid we are enabled to increase the speed of an emulsion to an almost unlimited extent; besides which, it forms with pyrogallic acid the active agent by which the majority (in this country, at least) of the exposed sensitive salts or latent images are developed to a successful issue; for these purposes we employ ammonia either in the liquid form or a solution of the solid carbonate. It is also recommended either in one form or the other as a valuable addition to the positive printing-bath, in order to prevent the liberation of sulphurous acid, and the consequent destruction of the prints.

Owing to the extreme volatile nature of ammoniacal gas when dissolved in water, it is largely used in the arts for various purposes, the well-known liquor ammoniæ, generally having a specific gravity of near about ·880, contains the largest amount of this volatile and strongly alkaline pungent gas. It is outside the limits of these columns to treat of the numerous uses to which this gas is applied in the arts and manufactures; there is one, however, to which we might refer, since it has a direct bearing on studio furniture and picture-frame mouldings. Wood carvers and cabinet makers of the antique, when desirous of imitating old furniture with new wood, principally oak or walnut, are wont to resort to ammoniacal fuming, precisely in the same manner as photographers employ it for increasing the sensitiveness of silver paper for positive printing, with this difference in point of time: three to thirty minutes generally suffices for most samples of photographic paper freshly prepared, and an hour for those permanent sensitized papers containing a large percentage of citric acid; the fuming of wood, however, occupies a fortnight or more, to effect the desired result. In many formulas we have met with, the simple term ammonia is used, but this is not sufficiently explicit; because it may mean the carbonate, or the more highly impregnated solution of the gas referred to above, or some other compound in which ammonia plays a part, such as bromide of ammonia, the two former behaving as exciters or accelerators, the latter being employed also as a restrainer in alkaline development. As the value of ammonia to the photographer as an accelerator in either form rests principally on its properties of alkalinity, we cannot do better than place before our readers a short resumé of the mode of manufacture, together with an easy method of ascertaining the amount of alkali present in any given sample of ammonia, with more scientific accuracy than the physical method practised by the druggist of bygone days, or rather before the Pharmaceutical Society possessed the influence it now enjoys.

The then prevalent custom was to impart instruction to novices by making them acquainted with the appearance, taste, or smell, either separately or collectively, of nearly all the principal articles kept in stock; the latter sense was always a *sine quâ non* in recognizing ammonia, the writer retaining a vivid recollection of this jocular method of teaching.

It is scarcely desirable to include diagrams of the appa-

ratus employed in the manufacture of ammonia, because this would necessitate our dealing with other by-products, such as pitch, tar, and aniline dyes, substances which are of considerable use to photographers, but are capable of furnishing enough matter for a series of articles devoted to their own peculiar properties. Nearly, if not quite, all the ammonia of commerce is obtained as a by-product in the manufacture of coal gas, which latter, as our readers are aware, is subject to a certain amount of purification after leaving the retorts and before entering the gas-holder. This purification consists in passing the gas through a vessel of water, which dissolves the ammonia, carbon dioxide, and sulphuretted hydrogen; these act together to form ammonic carbonate and sulphide, and in this form is known as gas liquor; the gas liquor is neutralized in a closed leaden trough with hydrochloric or sulphuric acid, and ammonic chloride or sulphate (according to which acid is used) crystallizes out in large quantities, and is collected in baskets for further treatment, the mother liquor being partially evaporated to obtain more crystals. The ammonia salt thus obtained is mixed with an equal weight of slacked lime, and heated in a large copper or iron retort, the head of which is connected to a series of large bottles partly filled with water, which absorb the gas. One volume of water at 32° F. absorbs as much as 1050 volumes of ammonia gas, and it is found that two volumes of water when saturated have increased to three volumes, with great rise of temperature, the gravity of the solution becoming less, *i.e.*, ·880 (water=1·000).

Ammonia should always be kept in well-stoppered bottles, and never opened more than necessary, as every time the bottle is opened the solution loses ammonia-gas, and becomes weaker in alkali. It is for this reason manufacturers of dry plates recommend dilution of the strong ammonia to form stock solutions, there being much less tendency at ordinary temperatures for the gas to escape from a twenty or thirty per cent. solution, than there is from one of the full strength.

A solution of ammonia is commonly known as spirit of hartshorn or volatile alkali, and on account of its volatile nature is often used to neutralise an acid to make a neutral salt, as an excess can easily be boiled off.

Commercial ammonia is liable to contain the following impurities, which can be easily detected, and some, no doubt, may have caused spots in emulsions, which at present are but imperfectly understood.

Carbonate.—A few drops of lime water causes turbidity.

Chloride.—Cautiously add nitric acid till acid, then a few drops of nitrate of silver solution. A white turbidity or precipitate indicates the presence of a chloride.

Lime.—A few drops of oxalate of ammonia solution gives a white turbidity, or is left as a solid residue on evaporation.

Sulphate—Neutralise with nitric acid; add a few drops of barium nitrate solution, a white turbidity or precipitate.

Lead.—A brown tinge on adding sulphuretted hydrogen.

Ammonia, when taken in quantity, is fatal to life, producing inflammation of the lungs, and stricture of the throat; frequent inhalation renders susceptible persons liable to suffer periodically from cold in the head. Such persons should not inhale the fumes from the alkaline developer more than is absolutely necessary, and whenever they feel an indication of an attack, should freely inhale the fumes of glacial acetic acid.

Ammonia-gas is soluble in alcohol, just as in water, but less freely. Dry silver chloride absorbs more than one-third of its weight of ammonia-gas, which is given off again on heating. It also forms solid compounds with the oxides of gold, silver, platinum, mercury, &c., which are decomposed by heat, frequently with explosive violence.

We have hitherto been dealing with the active principle, ammonia; we will now devote a little space to its compounds.

Ammonium iodide, or ammonium in combination with, iodine, was for many years largely used for iodizing collodion is prepared by decomposing calcic iodide with a mixture of ammonia and ammonia sesquicarbonate in slight excess. The solution (filtered from the calcic carbonate produced) on evaporation yields cubical crystals of ammonium iodide. This salt cannot be directly prepared from ammonia and iodine, owing to an explosive compound called iodide of nitrogen being produced by a complex reaction.

Ammonium bromide or ammonium, in combination with bromine, has been employed for the same purpose as the iodide, but is now largely used in emulsions to form silver bromide; also in the alkaline developer, where it acts as a restrainer, as previously mentioned. It is usually prepared by adding ammonia to hydrobromic acid until neutral, and evaporating to obtain cubical crystals.

This salt should never be taken internally, except under medical advice, owing to its peculiar effect on the system.

Ammonium chloride is a compound largely used. In its pure state it is employed in the manufacture of emulsions; perhaps its greatest commercial value is to be found in its use for the Leclanché battery, and as an ingredient in freezing mixtures. It was formally imported in large quantities from Egypt as a product of the distillation of dried camel's refuse, but is now prepared almost entirely from gas liquor (as previously stated). It may also be prepared by adding ammonia or ammonic carbonate to hydrochloric acid till neutral. Photographers may have noticed bottles containing hydrochloric acid that have been left untouched for some time have an incrustation round the neck and stopper; this is ammonic chloride, the hydrochloric acid uniting with the ammonia in the atmosphere.

Ammonium sulphate is largely used as a manure, and in the preparation of ammonia alum; it is soluble in twice its weight of cold, and its own weight of boiling, water. It is prepared from gas liquor, or may be prepared by adding ammonia or the carbonate to dilute sulphuric acid till neutral, and evaporating to obtain crystals.

Ammonium nitrate is frequently used for producing a low temperature for the formation of ice. When thrown on red hot coals the salt explodes, but when gradually heated in a flask by means of a lamp it decomposes entirely into water and nitrous oxide gas; this gas is now largely used by dentists to cause insensibility to pain, and is commonly known as laughing gas. Ammonium nitrate is prepared by adding ammonia to dilute nitrate acid and evaporating to obtain crystals; it is soluble in about half its weight of cold water.

Ammonium oxalate is prepared by neutralizing oxalic acid with ammonia; it is of very little use in photography.

Ammonium acetate is obtained by saturating glacial acetic acid with dry ammonia gas. If dilute acid is used instead of glacial, this, on evaporation to obtain crystals, gives off ammonia, and the acid acetate is obtained instead of the neutral acetate.

Hitherto this salt has been used principally as a febrifuge by pathologists; recently, however, it has been recommended for emulsion work, nitrate of silver being converted into an acetate, and afterwards bromide, by double decomposition. From our own experiments with this method, we were led to consider the neutral condition of this salt an important factor in obtaining a successful result.

Free ammonia can be recognized by its smell; or if the quantity is small, on warming and holding red litmus paper over, which changes to blue, or paper dipped in a solution of turmeric root is changed to brown. These colours are restored to the original on exposure to the air for a short time. Another very delicate test is known as Nessler's. A solution is made by saturating iodide of potash with mercuric iodide, and adding caustic potash solution till

strongly alkaline; if this solution is added in excess to a liquid containing a trace of ammonia or any of its salts, it assumes a brown tinge, or furnishes a brown precipitate, according as the proportion is less or more.

Strong ammonia solution can be estimated by weighing a measured quantity. If ten cubic centimetres are taken, it is only necessary to shift the decimal point one degree, and the gravity is at once seen; by referring to tables showing the amount of ammonia at various gravities the per centage can readily be ascertained.

Ammonia is usually determined by adding from a burette a standard solution of sulphuric acid to the ammonia solution (diluted and coloured with litmus) till the solution is changed to red. The standard solution of sulphuric is made by taking 49 grammes of pure sulphuric acid, and diluting to 1,000 cubic centimetres with distilled water; every cubic centimetre of this solution is equal to ·017 grammes of ammonia (NH_3). So if one cubic centimetre of original solution was taken, and it required 10 cubic centimetres of sulphuric acid solution, then 10 multiplied by ·017 gives the amount of ammonia in one cubic centimetre(=·17); this multiplied by 100 gives the percentage.

Solid compounds of ammmonia are distilled with an excess of caustic potash or soda, and the distillate collected in standard sulphuric acid: the over-plus of acid is now neutralized by a standard ammonia solution, and it requires less of this in proportion as the original compound contained more ammonia.

MR. IVES' SECOND PATENT FOR HIS BLOCK PROCESS.

WE now give the text of the second patent of Mr. Ives, which covers some of the details recently published regarding his method. The text of the first patent will be found on page 498 of our volume for 1883:—

To all whom it may concern:

Be it known that I, FREDERICK E. IVES, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in the Method of Producing Impressions in Line or Stipple from Photographic Negatives, of which the following is a specification.

My invention relates to certain improvements in carrying out the details of the process of producing line or stipple impressions from photographic negatives, for which I obtained Letters Patent, No. 237,664, dated February 8, 1881.

The essential characteristics of my patented invention consist in producing an impression in pure line or stipple from a photograph from nature or artists' work by first making a photographic negative of the object to be reproduced, then producing therefrom a relief-plate in which the variations of light and shade are represented by variations in the thickness of the relief, and finally producing an impression in printers' ink by impressing such relief-plate against a surface of raised lines or dots.

The object of the present improvements is to gain rapidity and economy in carrying the invention into effect. With this object in view I proceed in the following manner: I first produce a relief-plate from the usual photographic negative of the object to be reproduced, such relief having a white surface. I prefer to use a plaster cast from a swelled gelatine relief, because a suitable relief may be made more quickly and cheaply by this method than by any other.

Instead of making the surface of raised V-shaped lines or dots of paper, as described in my aforesaid patent, I employ printers' roller composition, or equivalent elastic material, the raised lines or dots being moulded or otherwise formed on the surface of such composition, in any convenient manner, of the forms shown in the exaggerated views, Figures 1 and 2 of the drawings.

One of the advantages of employing the printers' roller composition, or similar elastic material, is, that a single surface of such material may be employed in the production of a great many different line or stipple impressions. Another advantage is, that it is less likely than paper to injure the plaster relief in producing or receiving the impression.

Having thus prepared the photographic relief and the surface of raised lines or dots, the third requisite of my patented process—that is, the production of the line or stipple impression in printers' ink by impressing the relief-plate against such surface—is carried into effect by inking the lined or dotted surface with printers' ink, and then pressing this inked surface against the white photographic relief. The result is, that a line or stipple impression is produced on the white surface of the relief, the thickness of the lines or size of the stipple-dots depending on the degree to which the raised V-shaped lines or points on the elastic surface are pressed against the varying surface of the relief. From the line or stipple impression thus produced on the white relief a photo-engraving may be made by any of the usual methods.

Sometimes I employ a single elastic V-shaped line, instead of the surface of V-shaped lines, and impress each line separately.

I claim as my invention—

The mode herein described of producing an impression in pure line or stipple from a photograph from nature or artists' work, said mode consisting in first making a photographic negative of the object; second, producing therefrom a relief-plate having a white surface; and, third, impressing on such plate an inked elastic surface of raised lines or dots, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRED. E. IVES.

Witnesses: { JAMES F. TOBIN, HARRY SMITH.

INVESTIGATIONS AS TO THE ACTION OF EOSINE ON PHOTOGRAPHIC FILMS.

BY DR. H. W. VOGEL.

IN my investigations with various colouring materials, I have by no means confined myself to the wet collodion process, but have made numerous experiments with dry collodion plates and gelatine plates; indeed, my earlier experiments were made exclusively with dry collodion plates. Under these circumstances, it is quite unnecessary to say that colouring matters exist which act well on dry collodion, although they act better in the case of wet collodion. Still there are a few which behave in a contrary fashion, while if the behaviour with gelatine plates is taken into account, the whole question becomes very complex. As regards this latter point (the behaviour of colouring matter with gelatine plates) comparatively little has been published; but Clayton and Tailler obtained a patent for making eosine gelatine plates in France and Austria, but the patent was not allowed in Germany. In the specification they say that they dissolve eosine in ammonia (in what proportion?) and add one part to one hundred parts of emulsion. They also recommend the immersion of gelatine plates in an ammoniacal solution of eosine; the plates being then dried. Schumann also worked with eosine, and gave quantitative particulars. He obtained results without using ammonia,* but his plates were less sensitive to the greenish yellow than the indigo, while a recently published paper contains no more information. The recent communication of Eder (PHOTOGRAPHIC NEWS, 1884, p. 259) requires some notice, as he says that prints soaked in a solution of eosine, and exposed wet, behave differently from plates exposed dry; an observation which I have also made, but not yet published.

As regards the extent to which eosine exalts the sensitiveness, there is great diversity of opinion, and my first experiments showed that the action of eosine depends very much upon the nature of the emulsion; indeed, with two samples, one made in Berlin and the other in San Francisco, I obtained no result at all. In the case of the first a long exposure to the solar spectrum showed a region of activity between D and E: the addition of ammonia did not assist.

On the contrary, a bromide emulsion of moderate sensitiveness, which I made myself, showed a very good sensitive-

* The absorption band of the eosine silver bromide, in the presence of acetic acid, is rather nearer the yellow end of the spectrum than the absorption band of eosine.

ness for the yellow (about one-third that of the blue), when it was treated with a two per cent. solution containing one of eosine in four hundred, and one per cent of ammonia. Drying reduced the sensitiveness for the yellow by about one-fifth.

Better results were obtained with some plates containing iodide, and some of Monckhoven's, by soaking them in a solution containing two per cent. of eosine and one per cent. of ammonia ; the sensitiveness for yellow being about half that of the blue. These results show that the action of colouring matter is, to a great extent, dependent on the character of the emulsion.

I may remark that the amount of eosine added to the emulsion varied from one and a-half to five per cent., and that as regards the yellow the difference was not very noticeable ; but the sensitiveness to the blue was lowered as the amount of colouring matter was increased. The sensitiveness to the bluish-green, between E and F, however, became very notably less when much eosine was used. Two per cent. of the eosine solution (1-400) gave the best results.

A small proportion of iodide makes the emulsion rather more sensitive in the bluish-green, but without affecting the yellow.

It must be noted that the immersion of the plates in a solution of the colouring matter never gives such uniform results as adding the dye to the emulsion, as when the former method is adopted, fog sometimes results, and sometimes spots may be observed when the solution has not acted. Many plates refuse to take the colour at all.

The use of eosine in collodion emulsion is, however, far more satisfactory than in the gelatine emulsion, as eight drops of eosine solution (as above) added to 10 c.c. of emulsion made it more sensitive to the yellow than to the blue.

Still, it is impossible to overlook the circumstance that the wet process is best of all. But why is this? It appears to be due to the circumstance that the silver compound of eosine is itself sensitive, and the following experiments will serve to throw light on this point.

I added five per cent. of an eosine solution (1 to 400) to plain collodion, and allowed a plate to remain in a silver bath for five minutes, after which I exposed to the spectrum for intervals of 5, 10, 15, 20, 40, 80, and 160 seconds ; the ordinary iron developer was then used, and notable action was perceptible in the green, the bluish-green, and in the position of the absorption band of eosine ; but the action was only noticeable when an exposure of 20 seconds had been given, whereas one second would have sufficed in the case of a bromo-silver-eosine plate, a sensitiveness of twenty times as much being, therefore, indicated for the latter in the case of yellowish-green rays. The eosine silver compound is not decomposed by dilute acetic acid, although dilute nitric acid attacks it. We may from this justly conclude that when an eosine plate is sensitized in the bath, the silver compound of eosine is found together with bromide of silver, and that the eosine-silver compound is individually sensitive. The result of general observation indicates to us that two sensitive compounds used in conjunction influence each other favourably.

The following, which was added to a previous paper (p. 302), must be read in connection with the present :—

In the ordinary wet process, iodide of silver possesses but little sensitiveness for the deeper shades ; while bromide of silver also requires very long exposures to reproduce the deeper shades in the case of studio work ; but a mixture of the two salts is, perhaps, ten times as sensitive to darker gradations. Something analogous occurs in the case of the spectrum, as, with a short exposure, iodide of silver is only impressed a little beyond the line G, that is to say, in the dark blue. Bromide is impressed under similar circumstances as far as the line F (bright blue) ; but a mixture of both is sensitive as far as the bluish-green (lines *b*, E). In such a case, it is pretty clear that an especially sensitive silver compound is formed, which explains the peculiar action of eosine in the wet process. In the case of a dry plate this compound appears not to be formed, and the eosine merely acts as an optical sensitizer.

Thus, in the case of a wet plate, eosine acts not only as an optical sensitizer, but also as a chemical sensitizer ; cyanosine, for example, is analogous to its action ; but other colouring matter, as fuchsin and Magdala-red, act merely as optical sensitizers. In the wet process only such colouring agents should be used as are both chemical and optical sensitizers.

The next problem was to make the eosine silver compound available in the gelatine process, and for this purpose four cubic centimetres of eosine solution containing 1 in 400 were precipitated with 2 drops of a ten per cent. solution of silver nitrate, and the precipitate was dissolved in 2 drops of ammonia ; when 4 drops of this solution were added to 10 cubic centimetres of gelatine emulsion, a notable increase in the sensitiveness for the yellow was noticed ; indeed, tenfold the increase noticed when a mere addition of eosine with ammonia was made.

In conclusion, it may be remarked that the region of activity resulting from the use of eosine in photographic plates does not correspond exactly with the absorption spectrum of an alcholic solution of the dye, but tends more towards the yellow. This fact will not surprise the experienced spectroscopist, who knows that through the action of highly refracting media a shifting towards the red occurs. Eosine, besides giving an intense absorption line in the greenish-yellow, gives also a fainter one in the bluish-yellow ; but the influence of the latter is most notable when methyl eosine is used.

By-the-Bye.

A FRAGMENT OF HISTORY.

BOUGHT AT THE SALE OF EFFECTS OF THE LATE J. J. BENNETT, F.R.S.

Lot 201.—"The first photograph fixed from nature, obtained by Niépce in 1827."

Lot 204.—"The autograph memoir of M. Nicéphore Niépce on his own invention of héliographie, dated Kew, 8th December, 1827, together with an autograph note of instruction ; also two impressions from a pewter plate, engraved by the héliographie process, and another impression of a landscape by the same process."

The above are extracts from the catalogue of sale, describing two lots that passed into our hands a few months ago. They have been examined with some care, and the results of that examination we propose to lay before our readers.

When Nicéphore Niepce came to London in the year 1827, he had already made two important discoveries. The first was in 1816, when he produced the first photograph ever taken in a camera. This photograph, and the circumstances under which it was secured, we have already described.* It was a picture of a pigeon-house taken direct in the camera upon paper sensitized with silver salts, and, as a matter of course, was a negative, the sky being black, and a pear-tree being shown in white. These pictures were not fixed in any way, and after a little while they gradually disappeared in a general discolouration of the paper. Still, it was a wonderful thing to have done, to have held fast a reflection of nature, even for the short space of a few hours. Why, some of our silver prints of to-day fade in a few years!

The next discovery was not less important, but the date of it is a little uncertain. We know that in 1820 Niepce occupied himself with researches connected with bitumen of Judea, and in 1823 we know also that he produced photographic prints by its means. But it was probably a year or so later before he actually succeeded in producing camera pictures of a permanent character by the aid of this sensitive compound. In any case, he produced a *permanent camera picture from nature* in 1827, for it is in our possession at this moment. The description of this picture in the handwriting of the late Mr. J. J. Bennett, F.R.S., is as follows :—

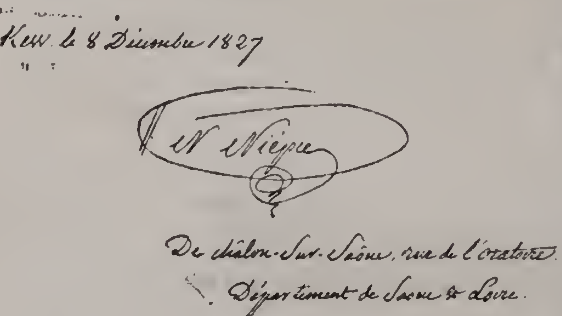
"The first photograph fixed from Nature, obtained by Niépce in the year 1827. Brought by him to London to illustrate his paper for the Royal Society, and given by him to his friend F. Bauer, of Kew."

* See "Photography and Photographers." (PIPER & CARTER.)

But just one word as to the authority of the picture before we proceed. A long time has elapsed between 1827 and the death (during the last twelvemonth) of Mr. J. J. Bennett: what was the history of the picture before it came into Mr. Bennett's hands? Fortunately, we have a clue in Mr. Bennett's own writing, for he says that Niépce gave the picture "to his friend F. Bauer."

Now who was Mr. F. Bauer? He was Secretary to the Royal Society (of which Mr. Bennett was a Fellow, it must be remembered), and it was to Mr. Bauer that Niépce came when he wished to submit his process to the Royal Society. Niépce deposited with Mr. Bauer a memoir and a picture, but as the process was not thoroughly described, the Royal Society, as we are aware, refused to consider the matter. This was at the end of the year 1827, and Niépce, returning to France in January, 1828, left both the objects in Mr. Bauer's hands.

How right Niépce was in this, is shown by the way in which Mr. Bauer afterwards championed his cause. Mr. Bauer carefully kept the picture, while the manuscript was submitted in turn to several savans. This manuscript, attested by Mr. Bauer, is also in our hands, bearing Niépce's signature, as under:—


Kew le 8 Décembre 1827
N Niépce
De Châlon-Sur-Saône, rue de l'oratoire.
Département de Saône & Loire.

The MS. is written very neatly, and, of course, in French. It describes a framed picture, as well as some prints on paper, and we have translated those portions that appear most important:—

"No doubt my framed picture, made upon tin, will be found too weak in tone. This defect is due principally to the circumstance that the high lights do not contrast sufficiently with the shadows represented by the bare metallic reflections; but it will be easy to remedy this by giving more whiteness and more brilliancy to the parts that represent the effects of the light, by receiving the impressions of this fluid (light) upon plated silver, well-polished, and browned. In this way, the contrast between white and black will be much more marked; the blacks, being rendered more intense by some chemical agent, will lose their brilliant reflection, which is disturbing to the eye, and even exerts a sort of vanishing effect.

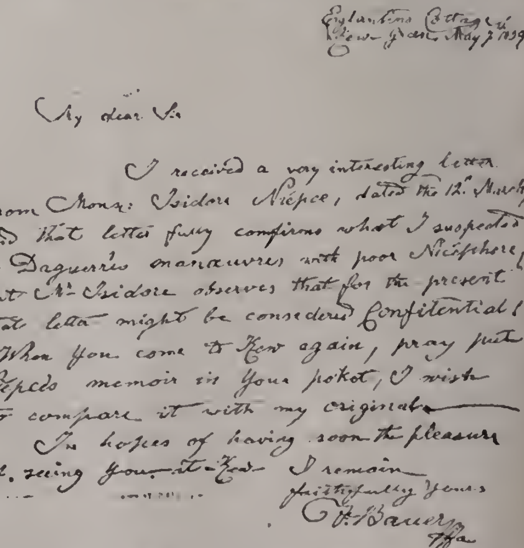
"My efforts at printing leave much to be desired, both in respect to the fineness of the lines and vigour. I only exhibit them, indeed, to show an important application of my process which may be improved upon. The difficulties I have had to surmount were less connected with the process itself than with the insufficiency of my resources in an art with which I am little familiar. It may not be unnecessary to add that the process may be adapted to copper as well as to tin. I have repeatedly produced images upon stone with success, but I believe that glass will be more preferable still. It is sufficient, after production of the image, to blacken slightly the engraved portion, and to place a sheet of white paper upon it, in order to obtain a vigorous impression. M. Daguerre, the painter of the Diorama of Paris, has advised me not to neglect this last mode of application, which, it is true, does not possess the advantage of multiplying the results, but which he *regards as eminently suitable to reproduce all the delicacy of nature.*

"Among the principal means for improving the process, those concerning optics must be put in the first rank. I was deprived of these resources in the few essays I made with the camera, although I strove to do my best by means of certain combinations. But it is with apparatus of this kind, perfected as much as possible, that a faithful image of nature may be obtained, and conveniently fixed."

Now several things will strike the reader here; as, for instance, the mention of employing a polished silver plate browned by chemical means. We know that iodine was among the chemicals he employed in the early days, and in M. Fouqué's history of the "Invention of Photography," it is said that the French philosopher also hinted at the employment of mercury. So that here there is certainly a paving of the way towards Daguerreotype. Another point is the mention of M. Daguerre himself, whom, it seems, Niepce visited in Paris, while on his way to England; while a third matter of importance is that Niepce tells us very plainly that our optical instruments must be improved before we can hope for any great success in photography.

And now to describe the "framed picture" of Niepce. It is upon a sheet of tin, and measures about 9 × 6 inches. It is doubtless a bitumen of Judea picture, but it has all the appearance of a faded Daguerreotype, and would be regarded as such by any casual spectator. There is a low roof of old-fashioned tiles occupying the centre of the picture, with buildings whose roofs only can be made out, on either side. Beyond, there is the outline of a tree or bush. That is all you can say about it. Indeed, so faded is the image, and so deceptive are the metallic reflections, that some little time is necessary to make out even these details. Fifty-seven years have elapsed, it must be remembered, since the bitumen surface was exposed and developed with animal oil of Dippel. According to experiments we have made to produce bitumen of Judea pictures in the camera, it is necessary to expose for at least a dozen hours in bright sunshine to produce anything like a successful result, and it is for this reason, no doubt, that Niépce chose for model some house-roof where there was plenty of light, and where the camera was not likely to be disturbed during the lengthy experiment. We carefully tested the metal surface for silver, but no trace of this metal could be detected.

But perhaps the most important object connected with


Eglantine Cottage
Kew Green May 7 1839

My dear Sir

I received a very interesting letter from Mons: Isidore Niépce, dated the 12. March, and that letter fully confirms what I suspected of Daguerre's manœuvres with poor Nicéphore, but Mr. Isidore observes that for the present that letter might be considered Confidential. When you come to Kew again, pray put Niépce's memoir in your pocket, I wish to compare it with my original.

In hopes of having soon the pleasure of seeing you at Kew I remain
faithfully yours
F. Bauer

our purchase of Mr. Bauer's relics is a letter from that gentleman's pen, with which we close this little essay. The secretary of the Royal Society, as we have said, warmly espoused Niépce's cause, and believed thoroughly

in his invention. Years went by, however, and in 1837 Niépce died, leaving, as we know, the secret of his discovery with two persons only—his son Isodore, and M. Daguerre, with the latter of whom he had contracted a partnership. Of late years there has been a disposition to regard Daguerreotype as due in part to Niépce, and it is of interest to know, therefore, that Mr. Bauer, who was the best independent judge living, was very much of this way of thinking. From the foregoing note it is quite clear that Mr. Bauer believed the invention to be due almost wholly to Niépce, and a more valuable testimony will never be forthcoming than these lines of the Secretary of the Royal Society. To whom they are addressed we know not, for, unfortunately, the name does not appear upon the letter; but this is of little importance. What concerns photographers at the present day, and all those who take an interest in its history, is, that the Englishman who knew most about Niépce's invention wrote this interesting epistle in May, 1839, a few weeks after Arago announced Daguerreotype to the world.

As we say, we do not know to whom this letter was addressed; but whoever it was, he came at once to visit Mr. Bauer, and brought Niépce's memoir to compare with the original. And that original MS., as well as the one alluded to in the above note, is at present, we are glad to say, safe and sound in our possession.

Review.

DIE COLLODION-VERFAHREN. Achte Auflage. Von Dr. Paul E. Liesegang. Preis M. 2·50. (*Dusseldorf: E. Liesegang's Verlag.*)

DER SILBERDRUCK. Achte Auflage. Von Dr. Paul E. Liesegang. Preis M. 2·50. (*E. Liesegang's Verlag.*)

ALTHOUGH one would certainly not be justified in now regarding the collodion process as the principal method of making negatives, there are many persons in this country who use it exclusively, and its advantages over gelatine for enlarging work, copying, and the reproduction of negatives, will not be contested by many. We are, therefore, glad to see a new edition of the thoroughly practical manual of Dr. Liesegang. Not only do we find sound working details for making negatives by the ordinary collodion method, but full instructions in the best methods of intensification and reduction, how to make reversed negatives, the production of enlargements, the collodion transfer process, ferrotypes, and collodion emulsion work. A good index completes the book.

As regards the hand-book of silver printing, we may say that it is a good every-day working manual, in which rather more than half the space is occupied with a consideration of work on albumenized paper, while chloride of silver collodion comes in for the next largest share of the space. The chapter on enlargements is, perhaps, not quite so complete as might be wished, as we find no description of the gelatino-bromide process. This process has, indeed, already taken up a position of some importance, not only in reference to enlarging, but also as a mode of direct printing.

ISOCHROMATIC GELATINE PLATES.

BY DR. O. LOHSE.

IT is probable that there are very many compounds which can influence the colour sensitiveness of gelatine plates, and among others I have recently tried an alcoholic extract of turmeric root, and I find that this, under certain circumstances, acts as favourably as eosine, especially as the red develops well. Their colour sensitiveness was approximately equal between D and H (from the yellow to the violet), but without giving that prominence of the yellow over the blue which is observable in the case of eosine. It might be well to use a mixture of eosine and turmeric extract.—*Photographisches Archiv.*

Notes.

Thirty-two shillings a week is the average salary paid to the members of the photographic staff in the Imperial Printing Office at Berlin.

It was not the fault of photography that the spurious fifty franc notes issued for the last twelve months from a manufactory in Courbevoie were discovered to be forged. The photographic manipulations were faultless, but there was a defect in the paper and an error in the watermark.

Once more postage stamp portraits are popular in the United States. The best way of making a profit by them is to do like Mr. C. H. Tondorff, of St. Louis. When he has taken a larger portrait—let us suppose a cabinet—he suggests making stamp pictures from it. He charges one and a half dollars for one hundred, or twelve dollars a thousand, all ready gummed and perforated.

Whether made direct from life, or from an existing portrait, the method of producing the stamp pictures is simple enough. A camera with several small portrait combinations is used—let us suppose four—and with eight shifts this will enable two dozen pictures to be taken on a half-plate. Immediately in front of the sitter is placed a paste-board frame or border, on which he can inscribe his signature in chalk. If the stamp pictures are made from a carte or cabinet, similar borders can be used.

Could not the *clichés* or types from which postage stamps are made be originated by photography; such a method as this, in conjunction with an engraving process, as that of Ives or Meisenbach, being used?

Speaking of the production of stamps by photography, we may mention that we have seen the collotype press used for the production of forged stamps on a considerable scale; but we do not care to say whether it was in England, Germany, France, or Belgium. They were printed in sheets of fifty, and so good was the imitation that we do not think detection at all likely. They were not produced with the intention of defrauding any national revenue, but in order to assist that harmless eccentric, the stamp collector, to complete his album of rare specimens.

Zinc dishes are not suitable for use in developing with ferrous oxalate; at any rate, this was the opinion expressed by Dr. Kayser when presiding over a recent meeting of the Berlin Association for the Advancement of Photography. Minute particles of zinc are cut off by the sharp edges of the plates, and these, settling on the film, cause spots; a proof of this being afforded by the circumstance that similar spots can be produced by dropping a little zinc dust on the film while in the developer.

The extemporisation of something that will serve as a developing dish is generally an easy matter, for a sheet of stout letter paper with the edges turned up and pinned,

answers admirably; only it must be supported on a rigid surface, such as a board, a glass plate, or a slate, and lifting threads should be used. A more permanent dish can be made by turning up the edges of a ferrotype plate or sheet of tin plate; but zinc must be avoided for the reason already stated.

Although photographers and others who have occasion to work with pyroxyline and nitro-derivatives of the same nature know the need of caution, few persons imagine any danger to exist in the free handling of the alkaline nitrates. Recent experiences, however, indicate that it is not safe to store such salts in contact with wood or other combustible materials, as the other day an explosion took place of a ton of nitrate of soda and a waggon in which it was contained. This happened at Horsemonden, in Kent.

We are about to communicate to some of our amateur friends a new and astonishing fact. It is this; that they can get their freckled portrait negatives satisfactorily retouched for a few pence. We are led to make this revelation because of late we have repeatedly seen excellent portraits that only required five minutes' skilful pencilling to render them perfect. No one more than ourselves deprecates elaborate retouching, but, as we have said before, it is grossly unfair to depict a damsel as afflicted with small-pox simply because her face shows a few freckles, and almost as bad to turn her fair brown hair into a jet black. A few pencillings done by a skilful retoucher who knows the vagaries of the camera will set these matters straight.

What we have just said is patent to all who give a casual glance at our advertising columns; but, strange to say, our friend the amateur is a bit of a conservative, and wants to keep on as he has been doing these many years past. "I have tried the pencil, but I don't like it," said a friend the other day; and when we looked at his performance we could well understand that he did not like it. As with many others, it had never occurred to him that retouching was an art, and a very delicate one, too, not to be acquired in half-an-hour. He would have been surprised to hear that some of our best retouchers are not only artists, but artists who have given years of study and practice to the particular calling they follow.

Bamboo is an excellent material, and the useful purposes to which it is put are endless. Still, there is one application made of it by photographers in the East to which it is eminently unfitted, namely, for rolling unmounted prints upon. We recently received some charming pictures from Egypt wound round a bit of bamboo, the knots of which had indelibly impressed themselves upon all the prints.

Little or no evidence of hard work is to be found in the second and final report of the Commissioners on Technical Education, which was issued on Friday; but the Commissioners have had some very nice touring in the best times of the year, and if a moderately intelligent holiday-maker, just returned from a month's ramble through Europe, were casually conversing on the technical education question, his remarks would perhaps be more to the point than those embodied in the official report.

What the Commissioners fail to say, is of much more real importance than all which we can learn from the report. They do not tell us that it is usual for the head of a scientific department in Italy, in France, in Germany, or in Belgium, to receive only a small fraction of the official pay which is given in Great Britain; neither does the report tell us that the continental *savant* may be found daily labouring among his students, while the English man of science is generally another person as soon as he gets an "appointment." It is certainly true that he delivers his lectures, but he is not always to be found in the laboratory, as he devotes most of his time to outside consulting work; frequently leaving the students in the hands of assistants, who, like the waiters at the restaurant, pay for their places. These "Articled Pupils," in looking out for the crumbs of patronage which fall from the rich man's table, cannot afford to assist the students much; indeed, it often happens that they have not the power.

Contrast this with the state of things at a continental school of technology, or, what will serve as well, the old Royal College of Chemistry in Oxford Street when it was under the direction of Dr. Hofmann—one whose love of hard work infused energy into every person in the establishment, and directly led to the establishment of gigantic chemical industries in England; but under the present system England is losing what it then gained. A thorough and candid report on scientific and technical education in England might be useful.

Talking some months ago with M. Rommelaere, whose photographic classes at the Polytechnic School in Brussels are ordinarily attended by about one hundred and fifty students, he remarked, "As the classes are free, we may hope to include almost every person in the city who has a real inclination for hard study or work, and when we find one who can make his mark, we take care of him."

This observation seems to strike the key-note of the highly successful Continental system of technical education. A wide-spread system of elementary schools and classes serves as a kind of index to the young population, and enables those in charge to find such as possess enough ability and industry to make it worth the while of the State to care for them. In England, the elementary schools are conducted as if all were equal in ability, and consequently much effort is wasted.

By using bichromate of soda instead of bichromate of potash for sensitizing gelatinous mixtures, certain advantages are realized, as the sodium salt is soluble in about its own weight of water, and a rather smaller quantity will produce a definite degree of sensitiveness.

Until recently, carbon printers could not obtain bichro-

mate of sodium as a regular article of commerce; now it is made on a large scale, and costs less than the potassium salt.

The position of the photographer on the staff of an illustrated newspaper becomes increasingly important. Mr. McSpedon, at a recent gathering of photographers in New York, said:—"Last summer I was connected with Frank Leslie's illustrated paper. Everywhere I went I would go directly to the photographer of the town, to get interesting points, and through him I gained a better and a readier means for illustrating my articles. I am convinced that very soon the travelling artist and correspondent will have very little to do. It will be the travelling photographer and correspondent.

The remarkable property of more or less completely dissolving cellulose, which is possessed by a cupro-ammonium solution, has laid the foundation of what promises to become a large industry, the manufacture of the so-called Willesden paper.

Although the manufacture of the material was commenced as long ago as 1870 (see our volume for that year, page 119), it is only recently that it has acquired much commercial importance. An interesting paper on the subject by Dr. C. Alder Wright will be found in the last number of the *Journal of the Society of Arts*.

The *Ladies Pictorial* last week issued the first of a series of competitive portraits of babies printed from photographs by some process, perhaps that of Meisenbach. The effort is a praiseworthy one, since it is an attempt to introduce the direct use of photography into illustrated periodicals. Naturally, the art of direct printing from photographs has not yet arrived at perfection, and good as these pictures are, we are afraid that the mammas will not make allowance for their shortcomings, and will be disappointed that their darlings are not flattered.

Photography has much to answer for in the case of Savanyl Joszi, who has been posing in Hungary as an imitator of Fra Diavolo. This gentleman was a sort of ideal highwayman, robbing only the rich, making presents to the poor, and equally ready to kill a man or make love to a woman. The latter propensity led to his downfall. A lady who had heard of the romantic bandit expressed a wish for his photograph, and, anxious to gratify her, Joszi ventured into civilized regions and sat for his portrait to a photographer. He paid for his temerity, as it was while he was being requested to "smile and look pleasant," that the police appeared on the scene. At least so says *Truth*.

The difficult task which the Royal Academy has every year of finding room for the pictures sent, and the probability that as the time goes on the labour will increase, has led an ingenious individual to suggest an easy method by which the problem may be solved. He calculates that two hundred excellent portraits of eminent persons can be condensed by microscopic photography into a space of the hundredth part of a superficial inch, and it would be easy, therefore, to pack ten thousand pictures or more on the walls of Burlington House. Every visitor would, of necessity, have to carry a powerful magnifying glass, and as for the drawback of the pictures being without colour, this is, as the *Globe*, in commenting on the proposition, remarks, "merely a temporary difficulty consequent upon our not having yet discovered how to make the sun paint as well as engrave." On the whole, though the plan might suit the artists who are now rejected, it is rather hard on the visitors. Why not, then, develop the idea further, give a detailed catalogue, illustrated with the ten thousand microscopic photographs, so that people may examine them quietly at home, and thus do away with the exhibition, its heat and fatigue.

Photography is rapidly assuming a very important position in relation to astronomical observations. In the course of a discussion at the last meeting of the Royal Astronomical Society on the observation of sun spots, it was remarked that owing to the rapidity with which the spots changed, no process of changing could represent them with sufficient accuracy, and what was wanted was a series of photographs on a larger scale than had hitherto been attempted. This attempt, it was elicited, is now being made at Potsdam, by Dr. Lohse, where the method adopted was to watch the sun with a high power, and wait until a moment of extremely tranquil definition arrived, and then an exposure was made by touching an electric button.

But perhaps the most emphatic endorsement on the use of photography was made by Mr. Norman Lockyer, who expressed his belief that in the future all astronomical observations will be made photographically, and he advised all astronomers to assist in obtaining a complete photographic catalogue of the whole heavens. Certainly the picture drawn by Mr. Lockyer, that in a hundred years time or so there would be a room filled with photographs giving a complete picture of every part of the heavens from the North Pole to the South, while the great telescopes would be charged with twelve photographic plates at a time, is no purely imaginary.

Patent Intelligence.

Applications for Letters Patent.

7678. Abel McDonald, Penrith, and Thomas Williamson Kendall, Cockermouth, both in Cumberland, Photographers, for "Improvements in apparatus for washing unmounted photographs and the like."—Dated 14th May, 1884.

7746. Thomas Furnell, 1, Matlock Villas, Lordship Lane, East Dulwich, London, Surrey, Civil Engineer, for "An adjustable-instantaneous shutter for photographic purposes."—(Complete Specification.)—Dated 15th May 1884.

7792. William Heath, 24, George Street, Plymouth, Optician and Mathematical Instrument Maker, for "An instantaneous shutter for use in obtaining photographic pictures."—Dated 16th May, 1884.

7853. George Brown, Photographer, 7, Broad Street, Deal, Kent, for "Retouching or re-modelling photographic negatives by aid of electricity."—Dated 17th May, 1884.

Patents Sealed.

416. George Duncan Macdougald, Chemist, of Dundee, in the county of Forfar, North Britain, for "Improvements in apparatus for storing, conveying, and applying, developing and other chemicals required or suitable for the production of photographic pictures.—Dated 2nd January, 1884.

5204. Harrison Garside, of the city of Manchester, in the county of Lancaster, Photographer for an invention of "An improved method of producing surfaces for mechanical or ink printing by means of photography."—Dated 2nd November, 1883.

Specifications Published during the Week.

4732. John Edwin Atkinson, of Greenwich, in the County of Kent, "Improvements in apparatus for use in transporting and exposing sensitized photographic plates on films."—Dated 29th March, 1884.

This specification is very long, verbose, and profusely illustrated with diagrams. The Patentee appears to claim the making of soft slides with envelope or flap closure of the back, and a draw-shutter in front. He seems, however, to prefer to put one of these into a rigid slide hinged to the camera. His claiming clauses are as follow :—

1st. An envelope for sensitized plates or films constructed of a frame closed at back by overlapping flaps, and provided with a dark shutter substantially as and for the purpose described.

2nd. The construction of the "back" for a photographic camera of a frame or receptacle adapted to receive an envelope of the kind herein specified, and having an opening at front corresponding to the opening in the envelope, and a slot at the side for drawing out the shutter of the envelope, and a door at back at which to introduce the envelope, substantially as herein shown and described.

3rd. The combined employment in the manner and for the purpose herein specified of a series of holders or envelopes for sensitized plates or films constructed substantially as herein described, and of a camera "back" constructed substantially as herein described to receive one such plate-holder or envelope at a time, and enable the plate or film to be properly exposed by drawing out the shutter of the envelope, such camera "back" working on hinges or in slides substantially as specified.

4735. Walter Bentley Woodbury, of South Norwood, in the county of Surrey, for "Improvements in methods of producing printing blocks by means of photography." Dated 5th of October, 1883.

This invention received Provisional Protection only, but we believe the essential features are embodied in a second patent.

My invention relates to surface blocks by the aid of which typographic prints may be obtained in the ordinary printing-press, and it has for its object novel methods of giving to the photographic negatives or positives the necessary qualities to produce from them such surface printing-blocks. These qualities have usually been obtained by breaking up the continuous half-tone of the negative or positive produced in the ordinary way by photography into a series of lines, simple or crossed, dots, or grain similar to that produced by a lithographic stone, or by effects similar to net-work or gauze. From negatives or positives so produced, printing-blocks have heretofore been obtained either by making reliefs in the well-known way, and pressing such reliefs into the surface of metal, or by transferring to zinc and then etching, also by exposing negatives so produced over a sheet of zinc covered with a substance having the property of becoming insoluble by the action of light, such as bitumen, or gelatine and bichromate of potash, and after removing the soluble parts, etching the parts left bare. These processes are, and have been for some time, in ordinary use, and my invention consists in new or improved methods for the production of negatives or positives suitable for the purposes above described. In order to put my invention in operation, I procure a series of negatives or positives from such objects as fine ruled lines, netting, gauze, dots, or a print from a grained stone. I use these as "resists," from which I make in the ordinary way what is well-known as a carbon transparency, and I transfer the same by the ordinary method to the negative or positive, and by then washing away the soluble portions I give them the necessary qualities. Or sometimes I make a photo-lithographic transfer, and I transfer the same to the negative or positive, and if sufficient density is not obtained, I dust bronze or other opaque powders over the image, so increasing it in force.

In another method which I sometimes adopt, by means of what is known as the dusting process, I coat a sheet of glass with a compound of gelatine or albumen, grape, sugar, and bichromate of potash, and after exposure under a negative or positive I sift over it suitable granular powders, or the material used for flocking paper, thus producing a grain negative or positive suitable for the purposes already described ; or I coat a negative or positive with the same solution, and I treat it in the same way as the plain glass. Or sometimes, by means of what is well-known as the Woodbury process, I make a relief image from the combination of the negative or positive and any of the various resists mentioned, and by rolling or other convenient pressure I make a reverse relief of the same in a sheet of enamelled or glazed cardboard ; this image I ink over carefully with an ink roller, and I transfer in the ordinary way the image so produced to zinc for etching, or to stone for lithographing. Or sometimes I take a gelatine relief developed on glass by the Woodbury process in the usual way, and having warmed the relief, I pour over it melted wax, paraffin, or similar suitable material, and on this I lay a sheet of plate-glass, previously greased and warmed, and after squeezing out the superfluous wax I allow it to cool. When set I detach the glass, leaving a smooth and even surface of wax, filling up the hollows of the relief. Over the surface so prepared I pass backward and forward a fine flexible and elastic V-shaped tool in the same way as in an ordinary planing machine, the tool cutting deeper or shallower lines according to the depth of the wax ; the same operation is then performed in a transverse direction, giving a series of cross lines varying in depth and thickness, and from this I take an electrotype, from which I take a second one, which forms the printing matrix.

1908. Henry Rafter, Artist, 1, Kingswood Place, Dacre Park, Lee, Kent, for "Improvements in obtaining relief printing surfaces." Dated 22nd January, 1884.

The principle of this invention, the prior conception of which I claim, consists in combining "process" for relief printing surfaces with "wood engraving." In the first place the surface of an ordinary wood block, metal plate, or other suitable surface, undergoes a preliminary engraving either by machinery or hand, whereby it receives certain "tints or grounds" required for a proposed drawing or work of art. After the surface of the block has been thus treated, the object of the process for relief printing surfaces is to raise up and create in these furrows and cavities, left by the preliminary engraving, certain matter, substance, or material, which, being artistically disposed, and distributed, over the block, will, in conjunction with the said "tints and grounds," represent in "proofing" the outlines, shadows, and general features of the drawing or work of art. The "lights, clearing, and cleaning," are then executed by engraving. I make use in part, of the process already patented in the two following expired Patents, as a factor in the practicability of my invention.

A.D. 1860, 21st Sept., No. 2309. An improved mode of producing relief printing surfaces.

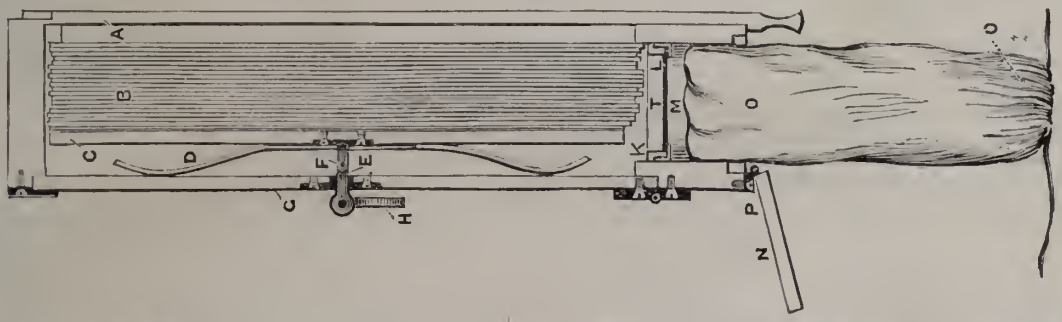
A.D. 1864, 15th Sept., No. 6041. Producing relief printing surfaces. The furrows or cavities already mentioned as being left between the ridges, or reliefs, by the preliminary engraving of the "tints and grounds" are filled, under pressure, with a material, such as pulverized chalk, oxide of zinc, &c., which is forced into an exact level with the top of these ridges or reliefs, producing a "prepared surface" apparently similar with the original surface of the block, uniform and polished. This "prepared surface" is then ready to receive the "artistic work," which will principally consist of the outlines, shadows, and general features of the drawing or work of art as distinguished from the "tints and grounds." This is either drawn direct on the prepared surface, or transferred, photographed, or otherwise projected on it ; inks, or other suitable mediums being used, which, wherever applied, will harden or protect the surface of the material pressed into the cavities. The rest of the material in the cavities, not having its surface hardened or protected, can then be brushed or wiped away. Whereupon the "tints and grounds" will appear in equal relief with the "artistic work" represented by the hardened or protected parts, the "tints and grounds" terminating, or rather merged in the "artistic work" wherever the latter crosses or covers them. A thorough hardening of the material left in the cavities can now be made, with either fluid silex, wax, varnish, or any suitable medium. If the "artistic work" is executed by "etching," intaglio engraving, photo-lithography, photo-zincography, or similar methods, it is necessary to procure an impression of the same in transfer ink on transfer paper, then coat the impression with an adhesive medium, and lay it on the

"prepared surface" under pressure until the adhesive medium has dried. Damp and remove the transfer paper, leaving the impression in transfer ink on the "prepared surface;" this ink will protect those parts that are not to be removed in the subsequent brushing or wiping. In this last operation the "material" will require damping. By means of the well-known effect of light acting on a film of gelatine sensitized by bichromate of potash, I spread a sensitized film of gelatine on the "prepared surface," and exposing it under a negative obtained from the "artistic work," I retain the parts acted on by the light, by brushing away after damping the film, and "material" unacted on, thereby leaving the "artistic" work in equal relief with the "tints and grounds."

5353. Heinrich Kayser, Doctor of Philosophy and Lecturer at the University in Berlin, of No. 16A, Neue Wilhelm Strasse, in the city of Berlin and German Empire, for "Improvements in photographic exchange boxes with sleeve for preventing the penetration of light to the plates."—Dated 24th March, 1884.—Complete specification.

My invention relates to the construction of photographic exchange boxes, the object of which is to permit the removal of the exposed plates, and to bring a fresh plate in its place in full daylight, without being compelled, as heretofore, to slide the box or case into a second case, in order to be able to effect the said manipulation; *id. est*, the exchange of a fresh plate for the exposed plate. By employing my construction of exchange boxes, I am able to exchange a series of 12 to 15 plates, when glass plates are employed, and expose them consecutively. The front or foremost plate lies just behind the slide in suitable position for exposing, and is, after being exposed, withdrawn and placed behind the other plates which have not been exposed. For this purpose, one end of the box or case is made to act as a door, so that the exchange can be readily effected by inserting the hand; as, however, the plates must be entirely withdrawn from the box or case, and it is necessary to exclude the light, I employ a sleeve of suitable material capable of excluding the light, which is slid or pushed over the arm of the operator. A suitably arranged spring or springs, presses or press against the moveable partition or false bottom of the box or case, and hold the series of plates firmly against each other when the outer or foremost plate is to be exposed, whereas a device is provided so that the pressure of the spring can be removed, and so that the plates rest loosely against each other and can be readily exchanged.

The accompanying drawings represent my improved exchange box or case in section. A is the slide for closing the box or case behind which the plates B, which are to be exposed, are arranged so that they rest against the frame of the box or case. The single plates are separated by an intermediate layer of black or other paper through which the light cannot penetrate, which said layer is loosely attached to the back of each plate. The plates B are continuously pressed against the bearing surface of the frame by means of a suitable spring acting on the moveable or false bottom, so that the front or foremost plate is kept in focus. I represents the side of the box or case which is formed to act as a door; which said door lies snugly against the two ledges or rails K and L, and is moveably connected with the box or case by means of a piece or strip of canvas, leather, or other suitable material, which is glued or otherwise attached to the box or case frame, and clamped tight by means of the ledge K or a suitable joint; hinge or hinges can be employed to the like purpose. The ledges K L serve also to hold the sleeve O of suitable fabric which will exclude the light, which said sleeve can be folded up and carried in the space M of the box or case between the door I and the outer door N to the exchange box or case, which said door is provided with suitable hinge or hinges, I. The requisite play for enabling the plates to be readily exchanged is attained by drawing back the false bottom or partition C towards the bottom of the said box or case, thereby compressing the spring or springs D, which can be effected by connecting a rod or spindle E to the false bottom C, which said rod E is provided with a suitable knuckle or other joint F, and reaches through the bottom G of the box or case. The outer end of the rod E is provided with a ring H, so that by pulling this ring outwards, the joint F is drawn to the outside of the box or case, the spring D compressed, and space or play for the exchange of the plates in the said exchange box attained, whereby the false bottom C can be retained in the position mentioned above by simply giving the outer end of the rod E a partial revolution of 45° around the knuckle or other joint, so that the said outer end of the rod E lies flush, or about flush, with the bottom or back of the box or case. As soon as the exchange of plates has been effected, the rod E is returned to its original straight position by means of the ring H, whereupon the plates are again firmly compressed by the intervention of the false bottom C and the spring D. My improved exchange box or case for photographic plates possesses, in comparison with the ordinary exchange boxes, not only the advantage of the enormous reduction in weight, but also of being able to employ plates of various sizes, for which purpose it is only necessary to insert a suitable adjustable or readily removable ledge to lessen the length or width of the said box or case, but so as to leave the space next the door, I, free. My said improved box or case can be employed for the ordinary dry plates, but is specially adapted for dry plates in which the emulsion is not attached to glass, but to a thin flexible plate of suitable material such as have already been the subject of various patents.



The photographic exchange box as shown in the accompanying drawing can contain about 50 of such said flexible plates, and when such said plates are about 18 centimetres wide and 24 centimetres long, weighs, inclusive of the plates, only about 4 lbs. The back or bottom of the case is also provided with suitable hinges to facilitate the introduction of the plates into the box.

Having now described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is—

1. The construction of a photographic exchange box or case in which the plates can be changed in full daylight by employing a suitable sleeve O of a fabric which will not permit the light to penetrate the same, thus rendering the employment of an extra case unnecessary, whereby the said box or case consists of the bottom or back G arranged to open on suitable hinges, the slide A, the moveable or false bottom or partition C, which said false bottom, and with it the plates, are pressed forward by means of a suitable spring or springs D, so that the plate to be exposed is pressed snugly against its seat in the frame, and of the door, I, formed in the one end or side of the said box or case, substantially as described and shown in the accompanying drawings.

2. The moveable false bottom C is provided with a rod E, which said rod has a knuckle or other joint F at about the centre of its length, and a ring A or its equivalent at the outer end, so that when the ring H to the said rod is pulled outwards, the rod E is drawn out through a boring in the back or bottom of the box or case, the spring or springs D is or are compressed, the false bottom drawn back, and the plates given free, so that the exchange can be made, for which purpose the rod E is turned on its knuckle or other joint F, and the false bottom held in its rear position, whereby the arm of the operator must be inserted in the said sleeve O of impenetrable material or fabric, substantially as described in foregoing specification and shown in the accompanying drawings.

3. The combination of the door N to the space at the end of the box or case to receive the said sleeve O, with the said sleeve of light-excluding fabric O and the door I to the inner space of the said box or case, substantially as described in the foregoing specification and shown in the accompanying drawings.

4. The general arrangement and construction of the parts of my improved photographic exchange box or case, substantially as and for the purpose set forth in the foregoing specification, and shown in the accompanying drawings.

CARBON PRINTING.

Lesson II.

Double Transfers upon Sawyer's Flexible Support.

For this process we shall require sensitized carbon tissue, Sawyer's patent flexible support, and waxing compound for ditto, composed of—

Yellow resin	...	...	...	6 drachms
Beeswax ...	...	...	...	2 ,,
Turpentine	...	...	...	1 pint

Also, two or three pieces of clean linen rag, a few ounces of fine gelatine, a little chrome alum, double transfer paper, in addition to the necessary negatives, printing frames, &c.

The tissue, being sensitized and dried, is cut up into the requisite sizes (remembering to have a sufficient margin outside the opening of mask upon negative, for a safe edge). Both it and negative being carefully dusted, the frames are filled and placed in the light for exposure simultaneously with the actinometer, each frame having marked upon the outside the number of tints it is judged the negative occupying it will require. Be careful that all the tints of the actinometer are equal in depth; do not let one tint be the proper depth, then the next black, and the next bronzed, else there will be no certainty of exposure, and nothing but vexation and failure can result.

The exposure being effected, the prints are withdrawn from the frames, and a piece of flexible support cut for each a trifle larger than the print, except they are carte-de-visite or cabinet size, when as many as convenient may be mounted together. This being done, each piece of flexible support must be prepared as follows:*— With a soft piece of rag moistened with the waxing compound, well saturate the glazed surface, allowing the solution to sink well in for a minute or two, then polish off with another piece of rag. Lay this piece aside, and proceed to treat the remainder of batch in the same way. Do not rub the surface too hard, but polish firmly and carefully, so as to get a highly polished surface, from which the prints will transfer to the paper with a surface very near akin to an albumenized paper print. With flexible support used for the first time, it will be as well if this operation be repeated so as to get the waxing compound well into the pores of the support; but for support that has been already used, once polishing after waxing will be sufficient.

The support being prepared, immerse a piece of support, with its attendant piece of exposed tissue, in clean cold water, slipping them in edgeways so as to avoid air-bells forming upon the surface, also examining each carefully for these, and removing them if formed.

When the tissue is first placed in the cold water it will curl a little inwards, and in a few seconds this curl will relax, and soon the tissue will lie flat, and if not removed from the water and mounted, will curl outwards, when it is spoilt; therefore, just before the soaked tissue lies flat, place the face in contact with face of flexible support, adjust in position, and remove from the water, place face upwards upon a smooth board, and, whilst the left hand is occupied in keeping the tissue in position, apply the squeegee vigorously with the right. If more than one piece of tissue is to be mounted upon a sheet of temporary support, immerse them all in the cold water at once, and after placing them *in situ* upon the flexible support (which for this purpose will be best laid upon the squeegeeing bench and well covered with water), cover the whole with a piece of American cloth, which will prevent the squeegee disturbing the prints; but when this is done, heavier pressure of the squeegee must be used than when the print is squeegeed without the intervention of the American cloth.

The tissue, being mounted upon the temporary support is allowed to rest for a few minutes, when it is immersed in water at about 100° F., and very soon the exudation of pigmented gelatine from between the backing paper and temporary support will indicate that the unaltered gelatine is yielding to the influence of the hot water, and, by inserting the finger-nail between the two papers, the backing may be stripped off and thrown away, care being taken to keep the print under the hot water during the operation of stripping off the paper backing; each print in the batch is treated in the same way, care being taken not to abrade the surface of those already stripped.

Now add a little water at about 130° F., and half-fill another dish or tank with water at 120° F., to which transfer one of the prints, and, holding it upon the surface of the water with the left hand gently lave it with hot water, when the pigmented gelatine that has not been rendered insoluble by the action of light will gradually dissolve, leaving the carbon image upon the temporary support, the development being complete as soon as the soluble pigmented gelatine ceases to flow, when the print is placed in cold water, the rest of batch being treated in the same way. As the flexible support can be used over and over again, prints that from either under-or over-exposure are useless, must not be destroyed, but with the good ones hung up to dry upon American pegs attached to a line in a position favourable to desiccation in a reasonable time; and, for the sake of economising space, instead of suspending the prints separately, they may be hung in pairs back to back.

The prints being dry, they are ready for transferring to the final support, which may be paper, opal, canvas, ivory, glass shades, vases, &c.; in fact, anything that will permit the application of a solution of gelatine and chrome alum to it without injury.

To transfer to paper, cut up some of the double transfer paper a little larger than the prints upon the temporary support, and immerse in clean cold water, taking care to see that the paper is evenly soaked. Also, in another dish of clean cold water, immerse the prints upon temporary support that it is intended to transfer.

Another dish is now filled with water at 120° F., and a piece of double transfer paper taken from the cold water and placed in it until the surface feels quite slimy; now remove the print from the cold water, and place it upon the squeegeeing bench face up. Place the slimy double transfer paper over it, slimy side in contact with the image, and apply the squeegee to the back gently but firmly, after which the print is hung up to dry; treat the rest of batch in the same way, and when all are thoroughly dry, insert the point of a paper-knife under the edges of transfer paper, when the two papers will easily separate, the image being now attached to the transfer paper, leaving the flexible support upon which it was developed quite clean, and ready after waxing for using again.

Those prints that, from errors in exposure or other causes, are valueless, are immersed in cold water, and squeegeed down upon a plate of ground glass flooded with a warm solution of gelatine 1 ounce, chrome alum 10 grains, water 10 ounces, and placed away to dry, when the flexible support may be stripped off quite clean, leaving the image upon the ground glass, which will serve as the receptacle for other failures in the same way.

If, instead of transferring the image from the temporary support to paper, it is desired to transfer to opal or canvas, the substance selected is freed from dirt and grease, and

* From Autotype Company's instructions issued with each parcel of Sawyer's Patent Flexible Support.

flooded with the above solution of gelatine and chrom alum, and after soaking the support carrying the image in cold water, place it in position, and apply the squeegee.

For transferring to ivory, before placing the print in cold water, place the ivory over it, and adjust the position, then cut the support to the size of ivory; now soak the print in cold water, then place both in the gelatine solution. Place in position, next remove from gelatine solution, and apply the squeegee, then, with a sponge, remove gelatine from back of ivory, and place between sheets of blotting-paper to dry; when dry, the support may be stripped off, leaving the image upon the ivory.

To transfer the carbon image to any object that cannot be manipulated easily—such as the panel of a door, a lady's work-box, or many other positions that may be required to decorate—this most excellent support will be found invaluable. In such a case, to the object it is desired to transfer the carbon image a solution of gelatine of double the usual strength is applied by means of a brush, and allowed to get nearly dry; the support carrying the image, previously trimmed, is soaked in tepid water, and, after placing in position, is squeegeed into contact. When dry, the support is stripped off, leaving the image behind. Any superfluous gelatine may be removed by means of a rag dipped in hot water, and if the print is in a position where it is likely to get spoiled by dust, two or three coats of a bright hard varnish will be advisable.

THE SPECTROSCOPE AND ITS RELATION TO PHOTOGRAPHY.

BY C. RAY WOODS.

VIII.—The Illumination of the Dark Room.

When we read that the feeble actinism of the red rays was noticed in the beginning of the present century, that the Daguerreotype was not introduced till 1839, and the Calotype of Fox Talbot till 1841, it is somewhat singular to find that developing by a light sifted through coloured glass does not seem to have been introduced till Claudet made it the subject of a patent in 1844. Whether early photographers performed their operations in darkness, or in a very feeble light, we are left to guess; but this much is certain, that the system that has been in vogue since the time of Claudet was delayed for some years through a disregard of facts which physicists had drawn attention to over forty years before. At that time the spectroscope in its present state was unknown; but that did not deter early experimenters in compounds sensitive to light from testing the power of different rays with the rougher apparatus at their command—the simple prism and hole in the shutter of Newton. Wollaston also tried the effect of coloured glasses, and Becquerel recommended that such coloured glasses should first be examined by the spectroscope, before the date of Claudet's patent. Since Becquerel's time the spectroscope has played an important part in the investigation of this subject, and it can readily be shown that the spectroscopic test, if properly carried out, is one that can safely be relied on, and, in its very simplicity, is superior to the somewhat haphazard methods more frequently adopted.

There are three things to be taken into consideration in the investigation of this subject:—First, the action of the spectrum on the sensitive compound used; second, the absorption of the glass and the illuminating effect of the light which passes through the absorbing medium; third, the comparative comfort—or, rather, the comparative lack of discomfort—of the light passing through the absorptive medium, this last-named consideration being mainly one of individual choice.

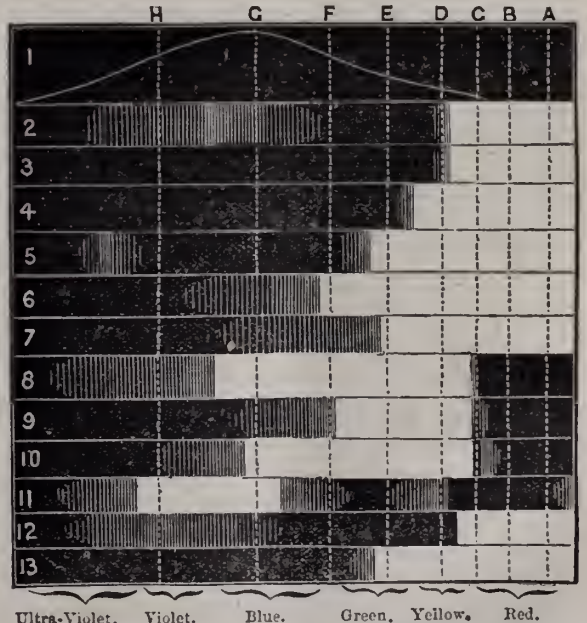
In considering the first of these, we are practically limited to one thing—the action of the spectrum on bromide of silver in its normal physical state, omitting, therefore, the state of bromide of silver when prepared in collodion by Captain Abney's process for photographing the red end. As iodide of silver, and a mixture of bromide and iodide of silver, are barely as sensitive to the visible rays of low refrangibility as pure bromide is, it follows that a light suitable for working bromide of silver in, is also suitable for the manipulation of plates containing iodide.

Bromide of silver, as has already been shown, is most sensitive in the blue rays, and it is absolutely necessary, therefore, that all rays in the blue and above the blue should be discarded for dark-room illuminating purposes. Below F, which is near the lower end of the light blue, the spectrum shows a marked decrease in its action on silver bromide. From F down to E the decrease is still more marked; and from E down to the red the action of the spectrum decreases at a regular rate. How low down in the spectrum any action is produced, depends mainly on the rapidity of the emulsion and the length of exposure.

This brings us to the second consideration. It is pretty obvious that the medium we use should not let through any rays above E; we are limited, that is to say, to that part of the spectrum from the yellow green downwards. Moreover, but for the high illuminating power of the yellow, and the fair illuminating power of the yellow-green, giving a comparatively large amount of illumination in proportion to its reducing power, our choice would lie within still narrower limits.

What medium, then, best fulfils the required conditions? In considering this, it will be well to look at the method of testing adopted by the spectroscopist, as a consideration of his *modus operandi* should silence some of the loose talk one is still apt to hear in photographic circles as to the supposed discrepancies between spectroscopic evidence and ordinary practice.

In the first place, one has recourse to an eye observation. Allowing a beam of light to pass through the instrument, the medium to be tested is placed in front of the slit, and its absorption noted. This is but the first rough test, however. The medium may let through some



1. Curve showing action of spectrum on bromide of silver. 2. Absorption of ruby glass. 3. Three thicknesses of ruby glass. 4. Stained red glass. 5. Orange glass, a lighter form of stained red. 6. Yellow glass. 7. Amber glass. 8. Signal green. 9. Yellow green. 10. Cathedral green. 11. Cobalt glass. 12. Magenta dye. 13. Aurine.

ultra-violet rays, which, being invisible, would escape detection by the eye, as in one important medium that may be instanced. It is necessary, therefore, that a photograph should be taken in the spectroscope; such a photo-

graph will not only show what portions of the spectrum the particular medium lets through, but will also give the relative reducing effect of the light which passes, showing, therefore, in addition, what rays may still be advantageously dispensed with. It is found that there is no part of the spectrum which produces absolutely no effect if the exposure be sufficiently prolonged, and the problem to be solved, therefore, may be briefly stated in the five words, "maximum light with maximum safety."

The foregoing diagram indicates roughly the absorption spectra of various transparent media.

It will be noticed that a single thickness of ruby glass cuts off the greater part of the spectrum above and including the yellow, but it also allows some blue and violet rays to pass through; in quantity this blue and violet is small, but it has a considerable effect upon the plate. There is, of course, some slight amount of general absorption in the red which cannot readily be represented in a diagram. If two thicknesses of ruby glass be taken, the amount of blue and violet light which passes is very small, and with three thicknesses it practically disappears. With each additional thickness of glass the general absorption in the red is also increased, so that three thicknesses of ruby appears considerably darker than one, but the additional safety is greater in proportion to the loss of light. Next, we have stained red, a glass recommended by Captain Abney, the particular kind he uses being stained a deep red on one side and yellow on the other. Lighter tints in stained red are also to be met with, one of the best orange glasses being of this character. When examined by the eye through a spectroscope, it appears almost as safe as the darker stained red, but a photograph shows that it lets through a small amount of ultra-violet rays at or about the same place as the rays which find their way through a thin film of silver. Yellow glass lets through blue rays in addition to green, yellow, and red; the amount of blue and green which passes varying considerably with the depth of the yellow stain. A glass that was used very frequently in wet plate days is amber, sometimes erroneously called orange. Even when deeply coloured, amber glass allows a certain amount of blue to pass, and its general absorption is very considerable, so that when sufficiently thick to ensure moderate safety, its illuminating effect is weak compared with other media. The absorption of the two most important greens, signal green—which is almost a blue—and yellow green, are shown in 8 and 9. In No. 10 we have the absorption of a slightly tinted glass, commonly used for the windows of ecclesiastical edifices, and generally known in the trade as "cathedral green." This glass varies considerably in tint, and the makers will only guarantee a particular shade when very large quantities are required; the diagram, therefore, cannot be taken as representing the absorption of all glass sold under the name. By itself it is practically useless for photographic purposes, and was introduced by Mr. Debenham for use with other media, to cut off the lower part of the red in the spectrum. In No. 11 we have the absorption of cobalt glass, the red between A and B, and most of the blue and violet, passing through with but little absorption. In 12 and 13 the absorption of magenta and aurine dyes are given. The first named allows all the red and orange and some of the blue and violet to pass, the latter giving a passage only to rays less refrangible than the blue. The two combined furnish a good medium when dissolved in varnish.

Stained red, letting through only the red, orange, yellow, and a little yellow green, approaches, if it does not actually reach, the ideal which spectroscopic experiment and ordinary practice proclaim as the most suitable medium. Careful experiments carried out in accordance with usual methods of manipulation, details of which would be out of place in these articles, show that it gives the maximum amount of illumination with maximum amount of safety. Modifications may, however, be conveniently introduced to suit the eyesight of the manipulator. Those to whose eyes yellow light is irritating may with advantage introduce a thickness of ruby, and thus work only with red and orange light. Those who dislike red light may cut off a great deal of it with a sheet of cathedral green, but at the same time they also sacrifice a small amount of the yellow as well, and weaken the illuminating power of the light in much greater proportion than they increase its safety. The illuminating effect of the light passing through good stained red bears a much greater ratio to its effect upon the plate than does a combination of stained red with either ruby or cathedral green. Those who can see well with rays of low refrangibility will find a good combination in stained red and cobalt glass, and will be using that portion of the visible spectrum which possesses the least reducing power.

So far, we have simply been considering the absorption of transparent media, but it is usually found convenient to diffuse the light by some translucent substance, such as thin tissue paper or ground glass. This will be found preferable to using the fabrics and papers which have been recommended from time to time, inasmuch as they derive a considerable amount of what safety they possess from their general absorption along the whole spectrum. This is particularly the case with canary medium. Of all the media of this character which have been proposed, the best by far is the common orange paper, frequently used for packing plates. The illuminating power of the light which passes through it is very considerable, compared with its action on a gelatino-bromide plate.

Correspondence.

NEW COATING MACHINE.

Dear Sir,—In answer to a letter from "Anxious," which appeared in your last issue, I do not know that any explanation is necessary for the non-appearance of the coating machine.

The facts are these. The engineer who has charge of the manufacture of the machine met with an accident, which incapacitated him for some time.

I have seen Mr. Oakley (the maker), who is justified in claiming a share in the honour of producing the machine.

I may say that, as far as my experience goes, the machine leaves nothing to be desired, and its appearance cannot be much longer delayed.

I am now working on a glass-cleaning machine, which I hope to bring out shortly.

I see no reason why a machine should not be constructed that will clean, coat, rack, and perhaps pack, in one operation.—I am, yours respectfully,

A. L. Henderson.

THE NETWORK METHOD OF PRODUCING GRAINED NEGATIVES.

Sir,—Can you find me room in your valuable journal for a few facts anent Messrs. Brown, Barnes, and Bell's Photo-litho Process, No. 4705, which appears in last week's "Patent Intelligence?" In their second method they claim the invention of using grained surfaces in front of the sensitive plate. Now, every observant reader of the News for the past few years must know the process—the only difficulty being in getting a proper grain. Now, I have been working the process for the last three years, and can bring forward photographers who have taken me negatives (samples of which I have sent you) repeatedly, and there is no doubt but what many more have tried the same thing.—I am, yours truly, S. C. Riley.

[The method referred to is very well known. It is remarkable that any fresh patent claims should be made respecting it. Mr. Riley's negatives are the best of the kind we have seen.—Ed. P.N.]

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 15th inst., Mr. F. W. HART, F.C.S., in the chair.

The CHAIRMAN said there was a sad duty for him to perform, which was to announce the death of their esteemed member Mr. H. Baden Pritchard. They all knew what a great worker he was in photography, especially in the literary part of it. All felt they had lost a friend; all felt sorry to hear he passed away from them so suddenly and at such an early age. After reading an extract from a daily paper in reference to this sad loss, he concluded by moving that the Secretary be empowered to send a letter of condolence to the widow and family, expressing the Society's deepest sympathy in the loss of so genial and clever a man. Carried by acclamation.

The SECRETARY read a communication from Mr. Beach, of the *Scientific American*, in reference to the Amateur Photographic Association recently started in New York, mentioning that they would be happy to hold correspondence with this Society. After some discussion it was arranged that the Secretary should write for further particulars.

Mr. W. M. ASHMAN enquired if any one had tried the samples of golden fabric he distributed at the meeting held on the 24 ult. ?

Mr. A. COWAN said Mr. Mackie had tested it by prolonging the development with only one thickness placed round a candle, and found no injurious effect from this light.

Mr. A. L. HENDERSON passed round a metal plate-box made with double grooves to contain one dozen half-plates. He enquired if any one had used tinned iron plate for plate-boxes, and, if so, had they found them injurious ?

Mr. W. E. DEBENHAM said it was stated at another Society that spots were caused by the use of metal cases. He would suggest bent grooves instead of square, as being easier to make, and occupying less room.

Mr. A. COWAN preferred the metal folded, as soldering could be done much easier.

Mr. W. M. AYRES suggested making the grooves of zinc, and in one piece.

Mr. W. M. ASHMAN found that minute particles of metal falling from a rusty nail or stove on to a wet gelatine negative would produce a black spot; he saw no reason why the particles caused by friction in these grooves should not do the same.

Mr. HENDERSON had observed the metallic particles on the surface of plates stored in these boxes.

The CHAIRMAN thought the chances of spots from this source remote, if the plates were brushed before developing; or a better plan would be to pass them over a pad of chamois leather.

Mr. HENDERSON, speaking on spots, said he remembered a case where grey rubber tubing used for washing an emulsion caused spots; on replacing it with red rubber, the evil ceased.

The CHAIRMAN said the same thing might happen with red rubber if a cheap tubing were employed. Those samples which had particles of dust adhering to them should be abandoned.

The following question from the box was then discussed:—"Why do negatives made from boiled emulsion fix out more than those made by the ammonia process?"

Messrs. COWAN and DEBENHAM questioned if there was any difference.

Mr. HENDERSON found three degrees were lost in the case of plates recently tried, and his remarks applied to boiled emulsions generally.

Mr. W. H. PRESTWICH said if this was proved to be the case, the difference must be due to the action of the developer and the greater permeability of an ammonia emulsion film.

Mr. DEBENHAM suspected a difference in the quantities of iodide used in making these emulsions.

Mr. COWAN called attention to a plate which had been divided into halves and exposed in the sensitometer; one half receiving three exposures of thirty seconds each, the other half, one exposure only. The half which received three successive exposures was not affected more than as much again as the one receiving a single exposure.

The discussion which took place became of a desultory character, several members being of opinion that sensitometers varied a good deal.

Mr. C. Ray Woods was elected a member of the Association.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Board held their monthly meeting on the 7th inst. at 181, Aldersgate Street.

The minutes of the previous meeting were read and confirmed, and Mr. G. Haupt was elected a member.

This being the first meeting of the Society since the decease of the Rev. F. F. Statham, their Vice-President, a letter of condolence was forwarded to Mrs. Statham.

The next meeting will be on June 4th, at eight o'clock p.m.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.

THE last ordinary meeting of the session was held in the College of Physical Science, Newcastle-on-Tyne, on Tuesday, the 13th inst., Professor BEDSON, D.Sc., occupying the chair. Messrs. W. C. Fletcher, P. Hall, and A. D. Fisher were elected members.

Professor HERSCHEL, M.A., &c., then delivered a lecture on "The History and Results of Improvements in Photographic Lenses," which was followed with close interest by a good muster of members. Professor Herschel related particulars of the first aërial telescopes of long focus, and explained the principles of correction of chromatic aberration of single lenses by which Hall and Dollond, at the middle of the last century, and Dr. Blair, produced compound objectives of two-feet focus equal in magnifying power to the single lenses of 60- to 120-feet focus made and used by Huyghens. The non-agreement of the focus of red rays with that of blue rays in a single lens was illustrated with the lime light, as well as the different positions in the same lens of the foci, towards which it collected rays passing through it respectively near its centre and near its margin. The removal of this second defect, or spherical aberration of objective lenses, is connected with the subject of increasing the angle and flatness of field, and of lessening distortion of the image in modern combinations of photographic lenses. As it embraced a much wider class of corrections than that performed by methods of achromatising, further explanations of it were reserved; and, if another opportunity for describing them should occur, it would form the subject for a future lecture.

The CHAIRMAN proposed, and Mr. J. P. GIBSON seconded, a vote of thanks to Professor Herschel, which was carried.

Six photographic prints, size 18 by 16 downwards, were then balloted for and duly handed over to the successful members. These pictures were given by Mr. Ed. Goold and Mr. P. M. Laws. The former gentleman also presented a few to the Society.

Mr. WM. RIDLEY was appointed Curator to the Society's album and portfolio, in place of Mr. Kemmish, resigned.

The Hon. SECRETARY showed an universal camera having revolving bellows and great length, the half-plate size extending to sixteen inches, and very light and portable; also, two of Guerry's pneumatic shutters (sent by Messrs. Proctor and Sons, of Newcastle). These were examined with much interest by members, and attracted general approval.

The meeting was then adjourned.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next meeting of this Society will take place at the Gallery, 5A, Pall Mall East, on Tuesday next, May 27th, at eight o'clock.

CITY AND GUILDS OF LONDON INSTITUTE OF TECHNICAL EDUCATION.—The following notice has been issued to those who entered their names for the forthcoming examination in photography:—"I have to acquaint you that the examination in photography for which you have been entered as a candidate will be held on Wednesday, the 28th instant, from 7 p.m. to 10 p.m., at the City Middle Class Schools, Cowper Street, E.C., in rear of the Finsbury Technical College. You are requested to be in the Examination Room at 6.45 p.m., after which time the doors will be closed.—I am, Sir, yours obediently, PHILIP MAGNUS, Director and Secretary."

RICE PAPER.—This is made from a plant of the ivy family, known to botanists as the *Arabia papyrafera*, a native of China, a specimen of which can be seen in the horticultural collection at Kew. In China it is said to grow seven feet high, with large terminal branches of twenty feet circumference, while, drooping

like magnificent plumes in regular form over the dark palmate leaves, are some twelve or fourteen white panicles, three feet in length. The stem seldom grows to a diameter of more than four inches, generally only about two, and forms but very little wood, but is filled with the most beautiful white pith, and it is from this the celebrated rice paper is manufactured by the Chinese.—*American Druggist.*

PHOTOGRAPHIC CLUB.—At the next meeting of this Club, on May 28, the subject for discussion will be "The Preparation of Lantern Slides." This being the last lantern night of the season, members and visitors are invited to bring slides.

To Correspondents.

*** We cannot undertake to return rejected communications.

S. FLEET.—The work is quite an elementary one, and rather treats of easy methods with which success is certain, than with the more difficult phases of the subject. As regards emulsion making, you cannot do better than to follow carefully Eder's directions for making a highly sensitive emulsion, as given on page 90 of "Modern Dry Plates." The most common sources of failure are overheating, the use of impure ammonia, or the contamination of the emulsion with such remains of previous batches as may be conveyed by the use of vessels of porous earthenware or imperfectly cleaned utensils. If you should fail, let us have full particulars of your mode of working.

F. S. L.—1. Make a hinge of vellum, taking care to glue it carefully in saw-cuts made in the wood. If you look at the action of a pianoforte you will see some vellum hinges. 2. It is not desirable to leave plates in the dark slides for longer than is absolutely necessary, as most wood gives off vapours which act more or less prejudicially.

J. M. C. G.—Although we rather think, from the appearance of the spots, that the defect is one existing in the original plates, we cannot form a decided opinion without seeing some of the negatives.

F. A.—We can hardly incur the responsibility of advising you to embark in the venture you allude to unless you have special facilities for the work; neither can we recommend you to spend much in advertising. If, however, you should advertise, you cannot do better than make your wants known through the medium of the PHOTOGRAPHIC NEWS.

SOUTH DEVON.—In our volume for 1881, on pages 45 and 231. All the back volumes may be consulted at our office.

J. S.—We do not think that there is any photographic association in your town. It is, however, probable that you might very successfully form one.

T. D.—The black deposit is gold, and a very large proportion of the precious metal is always deposited when the toning solution is kept as long as the time you mention. The only way is to restore its strength a short time before you have occasion to use it. Of course you will not waste the precipitate of metallic gold.

STUDENT.—You should obtain Captain Abney's "Instruction in Photography," as it contains very full information on all the points you refer to.

J. R. WILSON.—1. It would not be a reversed negative, but a transparency. 2. One of the best materials we know of for the purpose is the vernish sold as Crystal Paper Varnish. Take care to dry the paper very thoroughly before applying it.

C. R. B. D.—1. We have never examined this maker's apparatus sufficiently carefully to give you the information, but in similar arrangements which we have used, it has been necessary to put the eye close to the small sight-hole. 2. Adjust your camera so that some prominent object occupies the centre of the focussing screen, and then shift the view-meter until the same object is seen in the middle of the field.

S. S.—You can certainly obtain excellent pictures on 4½ by 3¼ plates with the lens you mention; of course assuming that you possess the requisite skill. Pictures of such a small size taken with a long focus lens will necessarily include only a moderate angle of view; and then there are many subjects which could not be included in the field, owing to the impracticability of removing the camera to the requisite distance.

PHOTO-PICTURE.—His present address is, we believe, either Philadelphia or Chicago; we are not sure which.

R. D. B.—1. Use a substratum: soluble glass one part, white of egg five parts, water 60 parts. 2. Cyanido of potassium will remove it. 3. We fancy you may be mistaken, as the thorough wesbing of a hardened gelatine film takes a long time.

SAM. JUTSUN.—The first article of the series appeared on page 482 of our volume for 1882, and they have been continued at intervals ever since.

PIN.—In the first place the film of gelatine is not of uniform thickness—perhaps you did not level the plate exactly; and in the second place, it appears to us that the film has become generally insoluble, possibly from exposure to the products of the combustion of coal gas. Much depends on the roller; you should use a lithographic roller in first-rate condition.

A. H.—It seems as if the newspaper reporter had misunderstood the matter.

G. E. W.—1. The process does not yield vigorous images in ordinary cases, but some variation may be made by regulating the proportion of silver in the hyposulphite solution. We have used it tolerably strong with moderate success. Dissolve four ounces of hypo in half a pint of water, then measure out two ounces of this, saturate with freshly precipitated chloride of silver, and add it to the bulk. 2. Prints produced by the ordinary carbon process might answer very well; there is no difficulty in developing them on the metal.

CAMBIA.—1. The burnishing bar should be so hot as to create a decidedly unpleasant impression when brought into contact with the back of the hand, but not hot enough to scorch the picture. 2. See page 102 of the present volume. 3. A normal iron developer will serve your purpose very well. See the Formulary on page 240 of the present volume.

AMATEUR.—Your pictures are out of focus, and appear to us underexposed. As regards the nature of the deposit, we cannot form any conjecture. Perhaps you use dirty dishes, or allow the developer to come in contact with some substance which causes a decomposition to set in.

W. H.—The articles were cheap; that is to say, if you can make any use of them. The large lens is a portrait lens, but not a very good one. Altogether, we should imagine that the things cost about £30; but if they were put up for sale at Stevens' auction rooms (the usual outlet for such goods), we do not think they would fetch much more than you gave.

S. C. RILEY.—We will write to you, and also return the negatives in a few days.

The Photographic News Registry.

Employment Wanted.

Spot. & Mounter, Recept.-Room.—Miss Smedley, 45, Gt. North-ter., Linc.
Printer & Toner.—F. K., 40, Brooksby-st., Liverpool-rd, N.
Reception-Room, Correspondent, &c.—A. J., 6, Marlbro'-st., W.
Printer, Toner, Vignetter, &c.—Carbon, *Photo. News* Office.
Printer, generally useful (age 19).—Runicles, Eton, Bucks.
Assistant Operator, Printer, Toner, &c.—Pyro, 38, Union-st., Birmingham.
Reception-Room, Mounting, Spotting.—49, Brecknock-rd.
Operator & Retoucher, German.—L. Welter, 66, Kilgrew-st., Falmouth.
Gen. Assist. (engineer).—J. W. Pateman, 60, Trent-st., Gainsboro', Linc.
Operator, wet and dry.—C. O., 25, Duke-st., Bloomsbury-sq.
General Assistant (young man, age 25).—M. D., *Photo. News* Office.
Printer and Toner.—L. Knight, 40, Brook by-st., Liverpool-rd., N.
Printer and Assistant Operator.—W. F. Dew, Jesson-st., Coventry.
Printer and Toner.—W. A., 18, St. Saviour's-ter., Bury-St.-Edmund's.
Retoucher, first-class.—H. Edwards, 11, Sharsted st., S.E.
Assistant Operator & Retoucher.—C. W., Susan's-rd., Eastbourne.
Retoucher & Reception Room.—A. D., 147, Victoria-pk.-rd., S. Hackney.
Colourist and Retoucher (lady).—F. W., 24, Fairview-ter., Salisbury.
Operator of experience.—Lux, 30, Mornington-rd., New Cross.
Assistant, to learn.—A. S., Rupert House, The Green, Tottenham.
Operator, wet or dry.—J. Ransdell, 12, George-st., Euston-rd.
Operator, Retoucher, Copyist.—F. M., *Photo. News* Office.
Reception Room, &c.—Z., 18, Cardigan-rd., Bow.
Retoucher, Spotter (lady).—Y. Z., 72, Aznhy-sq., Peckham.
General Assistant.—G. H. Barthorpe, 50, Victoria-st., Bradford.
Reception Room, &c.—Miss Ayre, 21, Dorchester-pl, Blandford-sq.
Copyist, Landscape, wet and dry.—X. Y. Z., *Photo. News* Office.
Operator, carbon and silver.—A. Hey, 71, Park-st., Aberdeen.

Employment Offered.

Gentleman of experience, for City warehouse.—H., *Photo. News* Office.
Printer, perm. to good man.—Benedetti, adjoining Peckham Station.
Coaters, (several).—J. D. England, 21, Charles-st., Notting-hill.
Operator, to take charge.—W. A. S., c/o Marion & Co., Soho-sq.
Lad, as General Assistant.—W. McLean, Hunstanton, Norfolk.
Apprentice in all branches.—Studio, 34, High-st., West End, Sittingbourne
Reception-Room & Retoucher.—Russell & Sons, 49, Brecknock-rd., N.W
Retoucher, to assist in reception room.—Artist, *Photo. News* Office.
Retoucher, male or female.—M., *Photo. News* Office.
Operator, experienced.—63, Darlington Street, Wolverhampton.
Spotter & Finisher (Lady).—63, Darlington Street, Wolverhampton.
General Assistant.—W. S. Laroche, 43, Mostyn Street, Llandudno.
Young Man, assist in print., &c.—W. S. Laroche, 43, Mostyn-st., Llandudno.
Oper. & Retouch.; Ferro. prof.—G. Threadwell, 288, Highest Stratford E.
Photographer for studio on the beach.—T. Sutcliffe, Dovercourt, Essex.
Operator & Retouch. (first-class).—Long & Co., Wellington-st., Woolwich
Reception Room, and Retouch (lady).—Artist, *Photo News* Office.
Negative Retoucher.—Williams, Talbot-pl., Darlington-st., Wolverhampton.
Tint, Spot, &c. (lady).—Williams, Talbot-pl., Darlington-st., Wolverhampton,
Operator, Retoucher, Lighting, Posing.—J. Moffat, 125, Princes-st., Edin.
Carbon Printer.—Personally at 11a, Wellington-st., Camden-town.
Operator, first-class.—F. V., 110, Southwark-pk.-rd., S.E.
Apprentice, out-door.—Mr. Dixon, 112, Albany-st., Regent's-pk.
Photo-mechanical Photography for America.—J. O., *Photo. News* Office,
Reception Room, good writer.—Turner, Barnsbury-park, N.
All-round hand, 30s.—Relph, Steam Circus, Hampstead Heath.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

DIFFICULTIES ARISING FROM IMPURITIES IN COMMERCIAL BROMIDES.

AT the meeting of the Photographic Society of Great Britain held on Tuesday evening last, a conversation took place which may lead to the thorough elucidation of a matter of so much importance, that we cannot help feeling surprised that it has not been seriously considered before.

Mr. Sebastian Davis having remarked that in one case great importance had been attached to the obtaining of bromide of potassium from one particular dealer, conversation became general upon the subject of variation in the bromide, and some half-dozen persons spoke strongly in favour of what they seemed to regard as special qualities of the article. It was then suggested that the commercial bromide may—and, indeed, often does—contain traces of iodide and chloride, to say nothing of possible contamination with a small quantity of carbonate of potassium, or even bromate of potassium. Although these impurities are not likely in any way to interfere with the ordinary commercial or medicinal uses of the salt, they may, and undoubtedly do, very seriously embarrass the maker of emulsions. Indeed, one can readily understand that the use of impure bromides reduces the making of emulsion about to the level of a game of chance; but we hope that a valuable suggestion made at the time by Captain Abney may be so thoroughly carried out as to effectually clear one difficulty for the path of the emulsion maker. Captain Abney, in commenting upon the subject, suggested that a committee of the Society might be formed to deal with and report upon the question, and expressed a hope that this might be brought before the next meeting of the Council. If this is done, and Captain Abney can be induced to take an active part in the laborious investigation which will become necessary, much good must of necessity follow.

It may, at first sight, be supposed that the whole question is an easy one, and can be dealt with without much labour; but this is not by any means the case, as only those who have had most to do with the estimation of the halogens in the presence of each other—or even their detection when in small quantities—can properly understand the difficulties of the position.

It is, however, as was pointed out at the meeting, a very easy matter indeed to prepare bromide of potassium which shall be perfectly free from all traces of either chlorine or iodine; easier, indeed, than to ascertain the absolute freedom of a given sample from traces of these haloids; but either operation requires the skill of an experienced chemist. To prepare the pure bromide, the principle of fractional decomposition must be adopted, as suggested at the meeting, and we will briefly indicate how the operation may be conducted on a small scale. A known quantity of bromide of potassium or sodium is placed in a retort along with sufficient water to more or less completely dissolve it, and a reagent capable of liberating bromine is added in sufficient quantity to liberate a certain fraction of the bromine—say one-fifth.

Heat is now applied so as to cause the whole of the liberated halogen to distil over, and when this is the case the receiver is changed, suitable precautions being taken to prevent any lodging of impurity about the neck of the retort. Another portion of the reagent for liberating the haloid is now added—let us suppose enough to liberate four-fifths of the remainder, and the distillation into the fresh receiver is proceeded with; certain precautions to prevent the carrying over of solid matter from the body of the retort being of course necessary. The fraction now in the receiver will consist of bromine free from either iodine or chlorine, the former having passed over with the first distillate, while the latter will remain in the retort. From this bromine the potassium salt can be prepared by well-known methods. As regards the reagent for liberating the halogens, chlorine gas itself may be used if careful precautions are taken, as this substance sets either iodine or bromine free instantly; but in most cases a mixture of a bichromate and sulphuric acid, or of manganese peroxide, and sulphuric acid would be preferred, these being, as is well known, capable of liberating all the haloids.

It must be remembered that in nature the three halogens are invariably, or almost invariably, associated; hence it happens that notwithstanding the commercial process for separating them is virtually the method of fractional decomposition described above, it very often happens that owing to careless manipulation traces of all these haloids are present in bromides as usually sold. Some years ago we received and used large quantities of German bromine in the original packages, and we generally found traces of iodine, and nearly always a small proportion of chlorine; but we never found a large proportion of either one or the other. At the meeting of the Photographic Society mention was made of a sample of commercial bromide containing as much as a third or a fourth of its weight of chloride; but, as Captain Abney very justly observed, this must have been due to an intentional adulteration.

At the meeting referred to, Captain Abney called attention to the separation of traces of iodine from a soluble bromide by fractional precipitation with a silver salt, and this method may be of great value to the experimentalist. The bromide is dissolved in water, and a weak solution of nitrate of silver is added, a few drops at a time, and with constant agitation. The iodine is carried down with the silver; and in any ordinary case one may be certain of having thoroughly removed all traces of iodine if enough silver had been added to precipitate one-twentieth of the haloid.

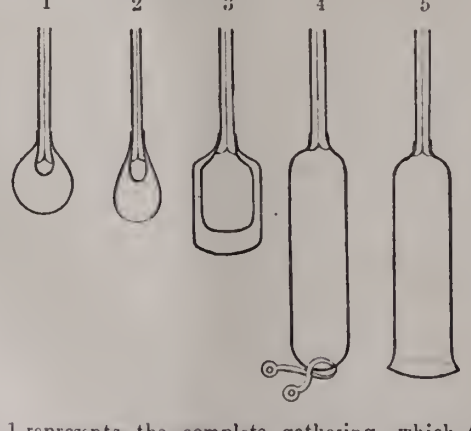
We sincerely hope that the council of the Photographic Society will appoint a committee to investigate and report upon the whole question of impure haloid salts.

GLASS.

(Eighth Article).

Very few manufacturing operations excite more curiosity than the art of glass-blowing. It is surprising with what attention spectators will follow the various manipulations of the blower and his assistants, for after listening to all the dry details of pots and furnaces, and so on, the young and the old brighten up when they are about to be shown the operation of fashioniug the crude material. Probably no article is capable of being fashioned or created from the raw into the finished article in less time than glass, and it is this fact that doubtless gives the process a touch, as it were, of the magical, and not unfrequently draws from spectators an involuntary expression of wonder and surprise.

If the reader will turn to page 226 of the last volume, he will there find a sketch of a glass furnace. Imagine the "gatherer" ascending the steps, and with his blowing-pipe he places himself about the position indicated by the iron door; then dipping the previously heated end of the pipe in the molten glass, by a twisting movement he gathers glass on the end of the pipe, much in the same manner as a cook would accumulate a mass of thick treacle about the bowl of a spoon. The "metal" is usually too thin to permit of the full quantity being gathered at one operation, therefore the workman withdraws the pipe when he has gathered a quantity equal to the size of an orange, and cools this first gathering by simple contact with the air, cooling also the pipe by pouring cold water on it. He then gathers again and again, three times generally, between each gathering cooling his pipe, and exercising care to keep the air-way open, otherwise, if the metal got into the pipe, the gathering could not be blown. In gathering for sheet-glass, almost invariably a large ring of fire clay is set to float on the top of the "metal" in each pot, and the gathering takes place from the space within the rings. The object of the rings is to prevent scum covering the surface of the pots, as it is found that as impurities rise they attach themselves to the rings and sides of the pot, leaving the centre clear and clean. It would occupy too much space to describe every detail of the operation of gathering and blowing, which would only be in place in a technical treatise, which this is not; but some notion of what takes place may be derived from a glance at the accompanying rough sketches.



No. 1 represents the complete gathering, which for a sheet of ordinary window-glass should be about the size of one of those round red Dutch cheeses we see in the shop-windows. At this stage the gatherer hands over the pipe to the blower, who forthwith proceeds to heat up the gathering—in Belgium, by holding it over the heated pot; in England, by placing it in the flame issuing from the blowing-hole of a separate furnace. The blower rests the pipe on an iron bracket, and keeping it continually turning, he stoops frequently to force his breath into the pipe, so as to elongate the gathering and enlarge the internal space, thereby getting the whole into the pear-shaped form represented by figure 2. When the gathering has been got thoroughly hot and workable, the blower leaves the furnace and proceeds to form the shoulder, shown in figure 3, getting the stuff thin near the neck, where it cools and sets, whilst the piece retains the most of the heat towards the bottom, the thicker end. By dexterously swinging the whole affair, sometimes clean over his head, sometimes holding the piece upwards over his head, and at other times swaying it to and fro, pendulum-fashion, just whether he wants it to run out quickly and take the form of figure 4, or to keep it back dumpy like figure 3, being guided always by the heat remaining in the piece, so that the ultimate form shown in figure 4 is reached. When this occurs, a boy approaches, and, with a pair of shears, he stabs a hole in the round end of the piece, and then cuts out the end or crown; the blower then re-heats, and quickly standing over the blowing-pit, holding the piece downwards, he communicates to his pipe a rotary motion whilst it is held perpendicularly, and this causes the cut-out crown to spread open and assume the form shown in figure 5. With thin glass, and especially in the Belgian works, the crown ends are burst open in the furnace by the blower stopping up the mouth end of his pipe with his hand, and holding the piece in the heat; the softened end then bursts open by the expansion of the air contained within the cylinder.

When figure 5 is reached, the blower runs down the steps and places the piece on the "cheval" or "chevalet," a wooden rest made to hold several pieces. He touches the pipe end near the shoulder with a rod of cold iron, which causes the neck to crack off and thereby release the pipe, which is then taken by a boy who knocks off the remains of the last operation, and prepares the pipe for the next gathering.

The dotted lines near the shoulder of figures 4 and 5 indicate where the neck and shoulder are removed. This operation is generally left until blowing ceases, when the blowers take a little hot metal on the end of a light iron rod in the left hand, and with a pair of tongs in the right hand they draw out a string of glass and encircle the shoulder at the dotted lines; then touching the place with a cold iron, the glass will crack, following the position of the hot string of glass, and the cap or shoulder comes off generally quite clean and neat, leaving a perfect cylinder open at both ends. This last operation accords with and is tantamount to the old experiment of encircling a bottle with a hot wire, or a string saturated with spirits, and setting fire thereto; local heat is rapidly communicated to the badly conducting material of the bottle, which, when cold water or iron is applied thereto, will usually crack in the position where the local heat had been in this manner applied.

The manner of blowing and general treatment here described is that most commonly followed; it varies in different countries and even in neighbouring works, but the general principle is the same, the minor details only varying.

The blower's duties end when he has stacked all his cylinders on end ready for the *splitter*. The journey is thus complete for that day, the blowers and gatherers collect the pipes and tools, and the furnace is again handed over to the founders and teazers, who charge the pots and fettle the furnace ready for another "found."

* Reference to previous articles, vol. xxvi., pages 675 and 737; vol. xxvii., pages 3, 98, 226, 419, and 757.

CARBON PRINTING.

Lesson III.

Double Transfer from Collodionized Glass.

Up to and including the exposure of the sensitive tissue, the operations are the same as for double transfer from Sawyer's

flexible support, but the temporary support upon which the print is developed is glass coated with a film of collodion.

The materials specially required are glass plates, 16 by 13, quite free from scratches; French chalk, which may be conveniently kept either in a penny pepper-box, or tied up in a piece of fine muslin; three or four clean cloths, or chamois leathers; a piece of macintosh cloth about 18 by 15; and some plain collodion made of

Methylated alcohol	1 pint
Methylated ether ·725...	1 ,,
Gun-cotton (Hopkins and Williams) ..	½ ounce

Dissolve, and allow a week to settle, then decant, or, if required at once, filter.

Preparation of the temporary support.—The edges of the 16 by 13 plates are first of all ground to prevent them cutting the fingers of the operator; they are then thoroughly cleaned with rouge and methylated spirit, and then finally dusted over with French chalk, and well polished with a clean silk duster or a clean leather. Dust the plate back and front with a broad camel-hair brush, attach a pneumatic holder, and coat with plain collodion. As soon as the film has set, immerse the plate (film uppermost) in clean cold water, where it must remain until the greasiness disappears.

Mounting the exposed tissue.—Upon a 16 by 13 plate, either twelve cartes, six cabinets, or eight promenades may be mounted at once; therefore the requisite number should be immersed in the cold water at the same time. Directly after immersion they must be examined for air-bubbles and thumb-marks, which must be at once removed by gentle friction. Now remove the collodionized plate from the water, and place as level as possible; then place the prints in position upon the plate, keeping each print from its neighbour, taking care not to disturb the collodion film, and also to get the prints in position as rapidly as possible, else some of them may absorb too much water, and refuse to lie flat.

All the prints being in position, lay the piece of macintosh cloth carefully over all (cloth side down), dip the squeegee in water, and apply vigorously to the macintosh.

The development is commenced by immersing in water at 100° F., and after the backing paper is skinned off, instead of trying to force the development by laying the water upon the prints, it is best to allow the development to proceed spontaneously, finishing off by pouring, from a small watering-can, a little hot water, so as to remove any grit, &c., that may settle upon the image; the development is complete as soon as the flow of soluble pigment ceases; then the plate must be rinsed with cold water, and placed away to dry.

When the prints are dry, carefully examine them for spots and other defects which must be removed at this stage, this being done by means of oil colours laid on with a fine sable brush.

The prints are now ready for the final transfer, for which double transfer paper is cut up into suitable sized sheets and soaked in cold water, then transferred to hot water at 120° F., until the surface is quite soft and slimy; now flood the plate containing the spotted prints with cold water, and place face up upon the bench, remove the transfer paper from the hot water, and place the surface in contact with the prints upon the glass; now apply the squeegee vigorously to the back so as to get absolute contact between the prints and the transfer paper; again place away to dry.

If the pictures were stripped off the glass directly they are dry, and afterwards mounted, they would lose most of the high glaze imparted by the collodionised surface; therefore, if it is wished to preserve this, the prints must be mounted previously to stripping from the glass. The best mountant for this purpose is made as follows:—Soak ½ pound of best glue in cold water until thoroughly soft, then dissolve in as little water as possible; when dissolved, pour into the jar of a Kent's egg-beater, and by means of beater keep the glue in a state of violent agitation while pouring into 10 ounces of methylated spirits of wine.

The transfer paper being dry, give a coat of the above glue; then cover with a piece of cartridge paper, and rub down well in contact all over; then give the back of cartridge paper a coat of glue, and allow to dry, which, in this case, must be very thorough, else the enamel glaze is sure to suffer. The whole being dry, run the point of an ivory paper-cutter round the edges of the prints, when the whole will readily come away from the glass. Now carefully trim the prints with the aid of a glass cutting shape and a sharp knife, care being taken not to abrade the enamel surface; then run a line of the glue (not too warm) round the edges of the print, and place in position upon the mount, and place under a weight to dry. The plates from which the prints are stripped merely require dusting over with French chalk and well polishing, when they will be again ready for use.

By-the-Bye.

SELF-CONSCIOUSNESS.

Self-consciousness mars nine portraits out of ten. That is to say, the fact of the model being conscious of the portrait being taken is observable in nearly every photograph, and as a result, the picture is more or less spoilt. Some people, of course, betray their consciousness more than others, and it is only the model himself who knows the full extent to which the cloven foot peeps forth. This matter of self-consciousness in photographs has, time after time, been put forth as an argument against camera portraits; and on behalf of the painter, it is urged that he never falls into the error of reproducing it. He is supposed to sit opposite the model hour after hour, and reproduce all the more winning characteristics of the face, while ignoring all such as are due to the unpleasant incidents of the sitting. Why he should not in these circumstances reflect a little boredom occasionally, as well as a bit of self-consciousness on the part of *his* model, we do not know; but we are told that his work is confined altogether to gathering all the beauty and espirit of his model, and transferring it to canvas. No doubt this is his function; unfortunately there is a wide difference between trying and succeeding, and, to judge from the portraits seen year after year on the Academy walls, it would seem that in most cases you must take the will for the deed.

In fact, it is here precisely where the public show a predilection for photographic portraits. If pictures could be painted according to the charming theory we have just expounded, which is advanced again and again by artists to prove that the photographer can never compete with the painter in producing satisfactory portraits, there would not be another word to say on behalf of the camera. Who can gainsay the painter in his wonderful professions? He seizes the smile as it hovers about the lips, the deep thought that marks the brow, the soft pensive expression straying over the eyes. All that his keen watchfulness sees, his subtle brush arrests, he would have you know; while on the other hand, the glassy eye of the camera, that stares on glowing warmth and icy coldness with equal indifference, simply reproduces the hard outlines before it. What can be more convincing than this argument, with which painters are ever ready to pulverise and utterly annihilate the poor photographer?

But where are these wonderful portraits of our painters? Granted, if you please, that there are six portrait painters at this moment in Great Britain who can do all this—though the Academy walls deny the fact year after year—what influence can these six men have? They require their hundreds, nay thousands of guineas for a portrait, and even if they only asked as many pence, the portraits they could paint would be but a very insignificant number. How are other people to fare who want their portraits? They must surely choose between the photographer and the second-class painter. So that with ninety-nine persons

out of every hundred it is not a matter at all whether a fine painting is not better than a fine photograph; this is beside the question; it is whether an ordinary photographic portrait is not better than an ordinary painted portrait—nay, if you like, whether a bad photograph is not better than a bad painting, in portraiture.

This is why people, despite the grand arguments of the painter, are content with a photograph. But then there is that grave fault—self-consciousness—to which we have alluded. No doubt; only if this is observable, as we say, in nine photographs out of ten, it is painfully apparent in every second-class painting. The vacant look, more or less rigid, and the pose, at once stiff and unnatural, are to be seen in the great majority of portraits accepted by the Royal Academy. In fact, if you took in your hand the same number of photographs issued by first-class studios, as there are portraits in an Academy exhibition, and were to pass all of them in review, we make bold to say there would be twice as many instances of "having your portrait taken" among the paintings as among the photographs.

Self-consciousness in portraiture is therefore not confined to photography; it is a fault still more common in paintings, despite the grand theorising of the painter. So that the public have come to make comparison not between the finest photograph and the finest painting, but rather between a defective photograph and a defective painting. We say defective, not in any inferior sense, but simply because both classes of portraits lack perfection. Since it is absolutely impossible for most people to get this absolute perfection in their portraits, they wisely choose the lesser of two evils, and take photography. A second-class photographic portrait may show the model in a bad light, but at any rate it is the person himself with all his individuality and identity, while the second-class painting is considered sufficiently good if it contain a "something" recognisable in the original.

While pleading guilty to the presence of self-consciousness in most photographic portraits—a defect that painters, at any rate, should be silent about, if we judge from their results rather than their professions—it must not be forgotten that the days of slow-acting films have long since past, yet the old criticisms passed on Daguerreotypes still cling to photography, albeit no model is asked now-a-days to remain quiet before the lens for two or three minutes. People still think—and some photographers among them, we are sorry to say—that it is absolutely necessary to adopt a fixed look during the pose, notwithstanding the circumstance that the duration of this is reduced to a very few seconds. Now there is just this difference between the photographer pure and simple, and the photographer who is an artist. Not content with occupying his mind with the pose, lighting, and drapery, of his model, the latter takes endless pains to get a happy—not necessarily a smiling—phase of the model's face, while the former's chief concern is all confined to the steadiness and immobility of the sitter. If the model has not moved, if he has kept his mouth steady and his eyes fixed, nothing can be more successful, thinks the matter-of-fact photographer, and hence came the old popular cry that all camera portraits were alike; they all possessed the same sort of expression. It could not well be otherwise in the days of Daguerreotypes, and even collodion in the hands of an artist failed very often to do what was wanted. But every day not only brings more artists into the ranks of photographers, but increases the power in their hands; and we trust that the time is not far distant when the artistic picture will be the rule, and the self-conscious portrait the exception.

Gelatine plates should do much to advance art-photography in portraiture. By their means the true artist has twice as many chances of success, for his tools are now so much sharper in their action. His efforts at successful lighting and posing will not be so frequently marred at the last moment by a defective expression; he is able to watch the features before him, and to choose the expression that pleases him most, whether this comes during a phase of animation, or during repose.

The main object, however, is, after all, to get rid of the look of self-consciousness. In presence of this, the most delicate and transient phases of expression—generally the most beautiful—are irretrievably lost. The photographer can do this properly in only one way, by not permitting the model to know the moment of exposure. But then the exposure must be of the briefest. With some nervous persons, even in these circumstances, it is necessary to pretend to expose once or twice before the flurry and excitement under which they labour is appeased; still, how he brings about the end is a matter that the photographer must settle for himself. We ourselves, a short time ago, sat for a portrait, without being aware of the moment when it was taken. The artist had finished lighting and posing us, and we were about to begin to feel nervous at the close proximity of the eventful moment, when we were told the expression would not do at all. And while we were in good faith trying to do something better, the artist looking on and criticising the while, we were quietly told it was all over, and that there was no necessity for nerving ourselves for the ordeal. The top of the spine had omitted its function of Rhumkorff coil in shaking the head-rest, and our expression had been seized before there was time to utter that phrase of "papa, potato, poultry, prunes, and prisms," which we have the authority of Charles Dickens for saying affords a proper setting for the mouth.

The photographic picture, if not yet perfect, is nevertheless a portrait, the value of which is so intrinsic that it will always be set before any other portrait, except, perhaps, a painting of the very first order. But it behoves photographers to strive their utmost to improve it, and this can only be done by first acknowledging its shortcomings. A rapid exposure is certainly one of the best means of encompassing the worst of these, self-consciousness, and our readers will do well in striving to minimise this defect to the utmost of their power.

FRENCH CORRESPONDENCE.

The late Mr. H. Baden Pritchard—Disputed Question of a Picture said to be Copied from a Photograph—Conference of Artists and Scientific Men on Photographic Matters — Operators' Examination — Balagny's Paper used in the Studio of the Museum of Decorative Arts.

The late Mr. H. Baden Pritchard.—I cannot take up my pen to commence this letter without expressing the deep sorrow the sudden and premature death of Mr. H. Baden Pritchard inspired. Among us in France he had many friends, who desire to convey some tribute of sympathy. He has left his example as a rich legacy behind to us, for he had the rare qualities of being both a learned and kind-hearted and amiable man, and a scientific and literary writer. On reading his works, one is struck by the diversity of his talents, as well as the facility with which he passed from one order of production to another. Those who, like myself, have personally been able to appreciate his character, and place him among the foremost of our friends, have suffered a great loss.

Picture said to be Copied from a Photograph.—A singular incident has occurred with regard to Dantan's picture in this year's *Salon*, "A Modelling Studio." The art-critic of the *Siècle*, M. Havard, on seeing the picture, was struck with its resemblance to a photograph in his possession. From that to accuse M. Dantan of having copied the said photograph was but the work of a few words in writing. "Mark well," says M. Havard, "that M. Dantan does not limit himself, like many of his colleagues, to make use of information directly acquired to assist in the working out of scanty notes. No, he borrows the whole thing at once, principal and accessories, figures, furniture, marble and

plaster groups, everything, including the effects of lighting and values; I would say also including colour. It is impossible for anyone to be a more sincere, respectful, or faithful copyist. In this respect, his *Atelier de moulage* is a prodigy. By illuminating the original photograph with skill, a more happy effect could not be obtained." The accusation thus set forth ironically is none the less grave. Indeed other journals have referred to it, and *La France* was particularly loud in exclamations of regret at this canvas being included in the purchases made by the State from the *Salon*. The Photographic Copyright Commission have found here a decisive argument in favour of their claim, and the president, M. Davanne, instantly wrote a letter, published in the *Siècle*, in which he pointed attention to the anomaly existing between the term "work of art" applied to a picture copied from a photograph, and the refusal of the term to the original photograph. He takes this pretext for drawing public attention to the necessity for the cessation of a misunderstanding in the terms of the law regulating the artistic copyright. It is there formally stated that photographic productions are excluded from participating in this law. Photographs often form the original ideas for works of art, and it is inconceivable why legally they are put aside and are victims of a law of exceptions. M. Dantan thought it well to reply without delay to M. Havard's accusation, by proving, in the presence of a jury of honour, that he had composed and executed his picture in one of M. Aviland's studios, in a manner, it is true, similar to the photograph M. Havard had had taken of the studio. It is, therefore, understood that M. Dantan executed his picture from nature. "All's well that ends well"; but it must be kept in view that an artist wishing to gain rapidity of execution may well think out his composition, group his figures and accessories, and then take a photograph which can be afterwards used for the picture. There is no crime in such a proceeding, and, from our point of view, a direct homage rendered to progress. It would be curious to say whether it was more meritorious to travel from one place to another by *diligence*, or take advantage of the rapid transit afforded by the railway. Admitting, for one moment, that M. Dantan had really used a photograph for his picture, would it have been judged as not coming under the name of work of art, and, therefore, not admissible as such to the *Salon*, or to be bought for the State collections? It only matters whether the work is beautiful. It is, if it be worthy of admiration.

Photographic Conference for Artists and Men of Science.—I said last time that the Syndicale Chambre had organized a conference on the intervention of photography in scientific and artistic work, to which scientific men and artists are to be invited. It will be a favourable occasion for defending the point which the Dantan incident gives rise to. At the conference, after indicating all round the advantages to be drawn from photography by men of science and art, the speaker will show the means of having always about one apparatus for photographic reproductions. A demonstration of experiments relating to the enlarging of negatives and projection of positives on the screen will also form part of the proceedings. The aim is to render the simplest photographic processes as popular as possible.

Operators' Examination.—The second session of operators' examination takes place on May 29th. The oral examiners are MM. Bardy, Davanne, and Léon Vidal.

Balagny Paper used at the Decorative Arts Museum Laboratory.—Since the formation of this photographic laboratory, Balagny's gelatino-bromide reversible pellicle paper has been exclusively used. I am pleased to state that it has given the best possible results, lending itself admirably to all kinds of reproduction, such as engravings, etching pictures, statuary, crystals, drapery materials, views, and monuments. The emulsion forming the sensitive film spread on the paper is very thin, giving full force of intensity without destroying the softness of the half-tints. An advantage consists in the capability of printing off from either side. It is best to mount the film on thin sheets of gelatine to give greater solidity. I do not hesitate to recommend this preparation above any other of the kind when using pocket photographic apparatus.

LEON VIDAL.

AMONG THE PHOTOGRAPHIC ARTISTS.

BY A WANDERER.

IT is questionable if there be any unfamiliar with the obtrusive designation, a "Photographic Artist." Clearly, in that part of his conformation which did duty for mind, the originator of this phraseological inspiration opined that a "photographic artist" was a species of its own, not an artist, else he would have said so, and not a photographer, or he would have spared himself the labour of writing two words when one would suffice. This is a restriction which, to be appreciated, required to be exercised; but this species of its own, this hybrid form selected without derivation or the authority of custom, once hit upon, a certain class take pride in proclaiming their absurd cognomen to the world.

There is one body of men who are *par excellence* "photographic artists," the peripatetic gentry who trudge our highways propelling a nondescript conveyance, half perambulator, half baker's barrow, and the tell-tale tripod duly strapped alongside. A certain intercourse with this genus may be desirable to discover how much, if any, of the photographer they can lay claim to, and how much of the artist in their half-and-half nomenclature appertains to them. Now professional pride may beget a repugnance to this experience, but this is a very wrong state of feeling.

But an animal is best studied in his haunts. The "photographic artist" is, according to the naturalists, an animal like the rest of us, but not so highly developed, and if he have one haunt preferable to another, it is that of the sands at Yarmouth. There are at home plenty of congenial fellowship and numerous brother workers all branded with the same trade mark, "photographic artist."

'Tis a fine beach these broad Yarmouth sands, so clean and firm to the foot, and as at high water it is never covered by the sea, the black-fingered gentry can exercise their lawful calling throughout the day, only regulated by a police order to keep all stalls in one line above high tide mark, and to pay a hebdominal two shillings in advance to the town authorities for privilege of standing.

Now underneath the pier is erected a wooden shanty, a drinking "cabin," where "photographic artists" and their attendant "touts," gipsies and shell fishmen, shrimp girls and comic singers, niggers and phrenological lecturers, chairmen, boatmen, fruit girls, and mendicants of all description, herd together in one strongly perspiring mass of struggling humanity, beer the aim of each, and elbowing, jostling, crowding, and crushing to indulge in their life's one luxury. There is little ventilation, and, what with the low roof, the seething mob of people now reinforced by a strong contingent of 'Arry's out for a 'oliday, the dense heat from the sultry July sun, the dirty faces, the still dirtier garments, the fruit, the fish, the cakes and the sweets, the combined odour is, to say the least, peculiar. Presently a few wailing discordant notes from a dulcimer out of condition break the never-ceasing monotonous hubbub of sound, while a cracked apology for a voice requests us to "Hold the fort, for He is coming." Surely that nasal twang proceeds from an old acquaintance! Was not this the individual, attired in the suit of seedy rusty black, the person who, the preceding night, was making the solitude of the sad sea waves most alarming, by aid of the wreck of a harmonium and a series of deep-throated appeals to be "saved?" Suddenly a stir is created among the "artistic" fraternity by a cry of "Joe, look to your joints!" and Joe, quickly putting himself outside the dregs of his half pint, sallies forth to a

select party of buxom girls and their swains, who are lost in admiration over a dirty frame of faded photographic specimens. Joe is a character. He might be a descendant of a wandering Hebrew with a dash of the man of the world thrown in; middle height, thin, wiry, florid in the extreme, and active to excess; endowed with a rolling eye, rather deeply set and piercing, and somewhat bloodshot; while a hirsute appendage conceals his sunken cheeks and his sensual mouth. He ambles through the crowd, and by a succession of leaps and bounds, is soon "on the track" for business. "Yes, dear ladies, you will make a charming picture, and if any man can do you justice, I can, with the quickest and the largest lens on the beach; so quick, ladies; I can scarcely open and shut her fast enough, and I am the only one who can take a *Metallika* picture by the new instantaneous process. None of the portraits here, ladies, which fade before you leave the barrow, but all taken by the last patent, which never fades. Thank you, dear ladies; this way, under the shadow of the boat, and all the whole lot for a shilling!"

Passing a variety of sweet stalls, cake stalls, try-your-weight stalls, nut stalls, fish stalls, "photographic artist" stalls, each with flag all flying, behold the gentleman who tells your bumps, sagaciously dilating on the phrenological development of Mr. Jenkins of London, Mr. J. perched aloft in a chair on a raised platform in full view of the jeering crowd, while Mrs. J., who is listening in rapt attention to this unfolding of the hidden life of her lord, is jocularly advised she has nothing to fear, for the gentleman might be trusted anywhere, so differently constituted to the last case that *he* could not go astray. Mr. Jenkins looks somewhat abashed at this proclamation of his marital fidelity, but Mrs. Jenkins regards with triumph the face of Mrs. Tomkins, wife of aforesaid last case, who was pronounced so emphatically a ladies' man. The crowd thickens, interest increases in the possibility of scandal, and the "touts" from the various "photographic artists" ply their vocation with redoubled energy.

Onwards past the happy family of cats, rats, birds, beasts, and fishes, on past the monkeys—"and you will be careful not to play with them to-day, ladies, for they are very savage"—and the centre of interest for cockneydom out for enjoyment is reached, a circular arrangement of chairs surrounding a platform on which disport themselves the comic singers. Here, in full blast of choral strains from husky throats that Clara is to come out to-night and keep her appointment on account of the brightness of the firmament, firstly attiring herself in hat and jacket, and lulling maternal solicitude by the platitude she will not be long. It is amidst the din of a noise such as this the "Professor" drives a roaring trade when not too far advanced in intoxication to hinder the performance of his work. Of course, he is a "photographic artist"; he wears a full beard, he would be too lazy to shave; he is unwashed, that is to say, his facial hue is of the same dusky tint as his fringed and rumpled collar, and what is left of the cuffs of his—possibly once white—shirt; he is a short, thick-set man, with hair of the popular ginger hue; and equally, of course, his hands look as though they had never been cleansed since a very early period of his existence. Surely, never was seen such a heterogeneous collection of broken-down cameras, mounted on diminutive and rickety tripods, as here assembled, and the visitors seem to enjoy being plagued by having these machines pointed at them, especially in the thick of the crowd. The light from the heavens is brilliant to excess, and the light reflected from the sea equally so. It is hot everywhere—dreadfully hot. It is, then, small wonder that with no shade, except that procurable from boats on the beach, the "photographic artists" turn out some rather ferocious expressions when anything like a face is visible on the plate, and when there is not a face to be seen, it is always the effect of *passing cloud*—but it will *dry* all right, believe me! The more ferocious the glance, the more the people seem to enjoy it; and the more readily the professor pockets his shillings—now from a donkey group, now from a spoony couple who fancy they are unobserved, here from a family party of a dozen of all ages, with a portly and pompous *pater* posing as the author and being of it all, and there from a group of bare-legged boys and girls engaged in the happiest of all childish occupations—that of making dirt pies in the sand.

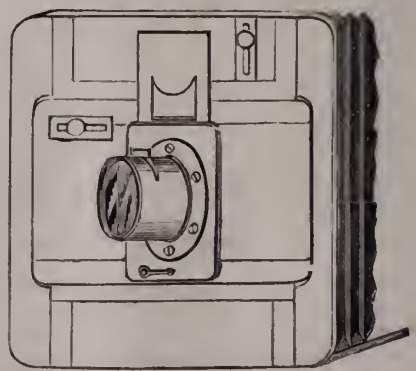
Yonder is a more pretentious arrangement, which has had the distinguished honour of being engraved among the *Graphic Sketches of Yarmouth* as a "beach studio," a sort of private omnibus converted into a dark-room for collodion work; but age and use have played havoc with it, and it seems to stand as a memento of fallen greatness, and indifferent to the rollicking life which teems around it.

Of a different class is the Australian, a short, swarthy specimen of the Colonial artist, and more than a match for his English *confrères*, with his never-ceasing chatter and quick *repartee*. "Oh yes, sir, quite ready for you; this way. Now we're busy; now we're doing the trade! You make a charming photograph, you do, sir! Half a moment, ladies—always make a beautful picture for the ladies—so clear, we can see what you've had for dinner! Here you are, sir, been waiting for you all the afternoon—beautiful light now, sir. Oh no, sir, I wouldn't tell a lie for the world—I wouldn't do it. If you've been imposed upon, perhaps it's my brother, who is just like me, and the biggest liar in all creation. Now, you little children, go home, and wash your dirty faces, and we shall give away the bread and butter at eleven o'clock to-morrow morning. This way, ladies, this way; all the work done here is for the benefit of the poor, and I'm the poorest man in the parish. This way; now we're busy. What, sir, not like you—not good-looking enough? Well, you'll never grow any prettier, believe me. Never mind, I'll nail it up on the barrow; it will do to frighten the birds away when I'm eating my dinner. Good day, sir, good-day!"

"THE SIMPLEX;" A CHEAP AND EFFECTIVE DROP SHUTTER FOR "BEHIND THE LENS."

BY W. CLEMENT WILLIAMS.

Who has not designed an instantaneous shutter? I venture to think there are few amateurs of even a slightly mechanical turn who have not done so. I have many, and confess to having wasted many an hour in seeking after a means of regulating the exposure to decimal parts of a

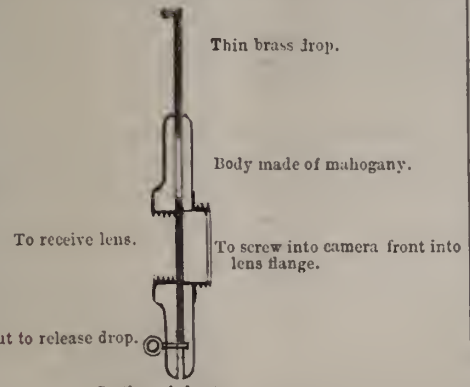


Shew's shutter screwed on to lens flange of any camera.

second, and other fine shaves; and it is astonishing what a fascinating power this hair-splitting mania has—in more matters than instantaneous shutters, however. One day, as I sat brooding over the problem, a little voice seemed to say—"It is no good whatever to regulate shutters thus finely, for no two horses can be yoked to the same cart unless they trot at the same speed, for it won't work.

First regulate the speed of the emulsion that covers the plate to a nicety, and not till then need you trouble about fine shaves in the trap that is to catch the sun-beam." And so as far as I am concerned the bubble burst.

The shutter I now rely on I have named the "Simplex," for in it I have eschewed the use of all complications; in fact, it is a simple drop-shutter, the novelty being that it works behind the lens, the advantages of which are now fully recognised. It screws into the ordinary lens flange



Section of shutter.

attached to any camera, thus obviating the necessity of alteration, and the system of adapting rings will enable its being used with any lens less than the shutter aperture. I thus use my shutter from 8½ by 6½ to 12 by 10 on different cameras, and with different lenses, the shutter being for 12 by 10. After the shutter is screwed to the camera, the lens is screwed into the shutter.

This shutter does away with the necessity of a lens cap altogether, for it is only needful to turn the shutter from the vertical to a horizontal position, to allow of any length of exposure being given, by simply sliding the drop of the shutter by hand, to open or shut, timing by the watch to suit, the cap thus being always dispensed with.

A little loose pin attached to a piece of string, piercing and crossing the slot under the drop, will hold the drop up till the moment of exposure arrives. Another hole, piercing the shutter over the lens, allows of the pin being inserted through the drop-shutter aperture when it is necessary to lower the drop for focussing, the pin thus holding it in its half-way place.

The drop is made of hardened sheet brass, so as to allow of the slot in which it slides being as thin as possible, the weight of such a drop giving ample speed for taking breaking waves and passing vessels in the foreground. There is another advantage, while on this topic, in consequence of the shutter working behind the lens. In addition to the full power of the lens being thus ensured, the drop, contrary to when working in front of the lens, uncovers the foreground or picture portion of the plate first, and so the moving object is caught and disposed of the instant the drop is released.

I have proved it to be light-tight, and a safe contrivance to have fixed permanently to the camera for all purposes, having worked it at the seaside for many days during the past summer, with the lens in the sun's eye, and the plate unprotected for long periods while waiting for a good shot. For those who would make it a permanent part of camera, no extra flanges are needful; the camera front would form the back of slot for drop to work in, and the whole projection need then only be three-eighths of an inch from camera. I had almost forgotten to say of this drop-shutter, that, coming as it does against the front of camera, wind has no effect upon it; wind is a great drawback to the use of shutters when placed in front of lens.

My shutter only cost a few shillings.

Review.

Light. By P. G. Tait, M.A. (*Edinburgh: Adam and Charles Black.*)

We have here a sound working text or class book, no attempt being made to unduly popularize the subject, and at the same time we find but little which need offer any difficulty to a person of average education.

The introductory or historical chapter interests us. After having drawn a parallel between light and sound, the author traces up the birth of the science of optics since the time when Aristotle seriously asked, "What is darkness?" The publication of Ptolemy's great work on Optics in the second century marks the first era in the exact study of the subject, and includes measurements of angles of incidence and refraction: although the trigonometrical relations between these were not discovered until a millennium and a-half had passed. Alhazen or El Hasan, who wrote his text-book in Arabic during the twelfth century, was almost the sole optical authority during a dark period of five hundred years. Alhazen founded his work on that of Ptolemy, but added a treatise on the eye. He showed how it is we see but one image with the two eyes, and pointed out how it is that we see, even the smallest object, by a pencil or bundle of diverging rays, and not, as had been supposed, by a single ray. Many points relating to astronomical optics were also elucidated by Alhazen.

The author does not treat much on points bearing very directly upon photography, but refers rather vaguely to the actinic rays as being merely vibrations too rapid to affect the eyes; and in speaking of the application of photography to the realisation of the idea of motion, through the agency of the wheel of life, refers to the photographs of the trotting horses; but does not mention the name of Mr. Muybridge, who, by his indefatigable labour, realised a substantial advance in photography as applied to science. We sought in vain for photography, photograph, or any similar word in the index.

All About Derbyshire. By Edward Bradbury. With twelve Platinotype Illustrations by Richard Keene. (*London: Simpkin, Marshall, & Co.; Derby: Keene.*)

The enterprise of Mr. Keene has given us a charming book treating of one of the most delightful districts in Great Britain. Indeed, we have already had a word or two to say regarding the work, and are pleased to now find that a fresh issue is required. The application of Platinotype printing to book illustration may be looked on as a happy one, for the soft character and cold tone of these pictures render them eminently suited for the purpose. Let us hope that we shall see no more new books illustrated with silver prints, as who can look on a faded book illustration without regretting that such an enduring reproach against photography should be stored up in so many libraries? It is, indeed, difficult to suppose that any photo-engraving or collotype method could so perfectly render the splendid effects of hazy distance in Mr. Keene's attractive picture of "Misty Morning in Ashwood Dale." "Goyt's Bridge" is a study which must be seen to be duly appreciated, the effect of the broken water streaming over the rocky bed being delightful. The "Runic Cross in Eyam Churchyard" forms a striking contrast with a wood-cut of a similar subject placed opposite to it, and suggests the hope that, in a future edition, Mr. Keene may see his way to replacing the whole of the wood-cuts by permanent photographs.

We need not discuss the literary merits of the book, although it has many; but we find that it opens with the usual lament of the English guide-book writer—that home beauties are neglected for Switzerland. This is certainly true, and will be so as long as economy is on the side of Switzerland. We have distinct recollections of the relative cost of a fortnight's holiday in Switzerland, and that of a similar time in the holiday resorts of Derbyshire.

Notes.

There are fewer actual manufacturers of gelatine plates than is ordinarily supposed, as most of those who profess and call themselves makers are merely dealers. Indeed, we could mention one provincial dry plate works which supplies no less than six professed makers. Or, to put the matter more concisely, the weaker are being ousted by the stronger; and only those who can successfully battle with unforeseen difficulties may hope to survive.

Still, we hear of a new plate works being established at Vienna, in which Plener's method is to be adopted. Herr Löwe takes the business control, while Dr. Eder acts as scientific adviser; and Mr. Plener is technical director for a time.

Is it necessary to remind our readers that Mr. Plener's method consists in separating the sensitive constituent of an emulsion by means of a centrifugal machine, and mixing it with fresh gelatine?

"Take a larger piece of bamboo and roll up the prints inside," says a correspondent who read our note of last week. "I have received prints from China which were packed in this way, and they were quite uninjured." Bad as bamboo may be when used as a roller for prints, it evidently makes an admirable protective casing.

There are, apparently, some photographers who pass their time in inspecting studios to let. A friend who has had the letting of a studio some four times in five years, has had one applicant call upon him on each occasion. The odd part is that the applicant never can remember he has seen the studio before. Four separate times has he inspected the place, and four times has he said it would not quite suit. Our friend firmly believes that if he were to advertise the same studio to-morrow, the first answer would be from this individual "on the look out," to use his own words, "for a studio."

Few spectroscopists would now think of relying on the eye for recording and mapping out lines, the work being done so much better and more rapidly by the camera.

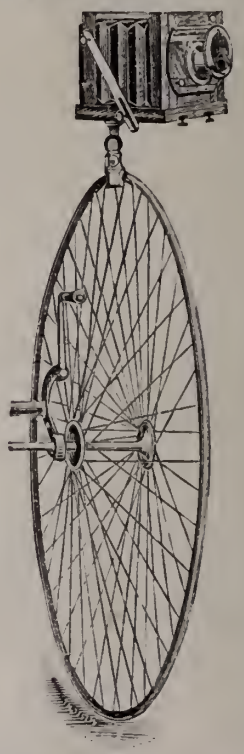
The recent researches of Liveing and Dewar illustrate the value of this application of the camera. When an explosive mixture of oxygen and hydrogen is fired in a close vessel, the flash usually gives a spectrum corresponding to the material of the vessel used, and in the case of an iron vessel with a quartz window, no less than sixty iron lines were recorded on the sensitive plate.

The photographer who makes his own chloride of gold will no longer dissolve half sovereigns if the proposed nine shilling token take the place of the coin; but a more serious fraud on the revenue would be the manufacture of the nine shilling token, a branch of industry which might be carried on in any photo-experimentalist's laboratory.

A small Fletcher's gas furnace, a pair of jeweller's rolls, apparatus for electrotyping in iron or nickel, and the smallest size hydraulic press, would comprise all the plant required for making both the dies and tokens.

It is remarkable that the "precious" metals, gold, silver, and platinum, should be so essential to the photographer, and it is interesting to note that a rich mine of the latter metal has been discovered in the Thames gold district of New Zealand. The metal is exceptionally pure, and crystallized in octahedra.

One may look upon the tripod stand as the most unmanageable article with which the photo-tricyclist is encumbered, but no tripod need be taken if a suitable clip is used to attach the camera to one of the large wheels. Messrs. Lancaster and Son, of Birmingham, send us the subjoined sketch, and we can readily believe that such a clamp



as is represented, may be very useful to others besides photo-cyclists, as the clips may be fixed to a fence, chair, or even the window-frame of a carriage. Indeed, it may be used under many circumstances when a tripod would be out of the question.

The idea of establishing a scientific society requiring a capital expenditure of £10,000, and an income of not less than £1,500 per annum, is an original one; but the curious part about the prospectus of the "Marine Biological Association of the United Kingdom" is the lavish manner in which the honours of the Society are to be conferred upon those who subscribe liberally. A donor of £500 or upwards is to be a governor and permanent member of the Council, while one giving £100 becomes a founder or member for

life. To give £1 1s. per annum merely constitutes one an "Annual Subscrib r." Mr. Frank Crisp is treasurer, and the office is at Burlington House.

The idea of organizing a naturalist's exchange post, now under discussion in Canada, is worthy of serious consideration, and it is suggested that the scheme might even extend to the whole of the postal union.

Careless packing of negatives having led to a regulation forbidding the sending of glass by letter or book-post, it will doubtless be found that the authorities hesitate to encourage the sending of parcels which may contain noxious insects, snakes, or bottles with pond-life specimens.

Notwithstanding the regulations, many negatives are sent to us by post. When merely placed between mill-boards or thin slabs of wood, they are almost invariably broken; but when a negative is sent in a box about an inch deep, and is well packed with bran or saw-dust, an accident is rare.

A regenerative burner for gas, which gives about four times as much light as when the gas is burned in the usual way, has been invented by Mr. Wenham. The advantage on the score of economy is obvious, but as less gas is burned, the total heating effect is proportionally diminished.

A firm in Chicago announces their intention of conducting their business in a different way from that of most other galleries. They intend to furnish finished proofs, and not ask any payment until the sitter is first satisfied with the proofs. The *Chicago Eye* considers this will "cause them lots of trouble and loss of money." Highly probable.

The magnesium light for portraiture may be regarded as one of the best artificial lights to use, as the apparatus required is of the cheapest description. No difficulty is likely to occur in working by the method described on page 347, except from a possible accumulation of fumes in the apartment. Of course the burning of the magnesium should be performed as near the fire-place as practicable, and a good fire materially assists by creating a strong draught.

The high price of magnesium shows no sign of reduction, as the price of the wire has been twelve shillings an ounce for over fifteen years; but the dust can be had for seven shillings. Chemists have often promised us cheap magnesium and cheap aluminium, but the promises have come to nothing.

The secretary of the Illinois Photographic Association has a pleasant way of putting matters. According to an American journal he "informs Mr. Ferguson, and *all fools like him*, that no notice of his communication or others of same tenor will be noticed or read to the Society." Neat, if not complimentary.

How best to manipulate the pyro, is a question often asked. This is what Mr. England says:—"Dissolve one ounce in four ounces of *absolute* alcohol, and measure the solution out with a dropping tube. Many fail with alcoholic solution because they use ordinary spirit; but if the alcohol is absolute, the preparation will keep well."

When half-plates are ordered, glasses $6\frac{1}{2}$ by $4\frac{3}{4}$ are generally meant; but it not unfrequently happens that the old or legitimate half-plate ($6\frac{1}{2}$ by $4\frac{1}{4}$) is required. Much trouble and difficulty might be obviated by calling the smaller size simply "half-plate" rather than "double quarter" or "semi-whole," and the designation, "extra half-plate," would clearly indicate the $6\frac{1}{2}$ by $4\frac{3}{4}$ plate.

Let us give an instance of the desirability of a uniform rule. A. orders a gross of half-plates, and the extra half plate is sent as being the size more ordinarily asked for; but as A. required the legitimate half-plate, he proceeded to cut down the plates, and in doing so fogged them. He, however, was unaware of this, and made a claim on account of bad plates, but as part of the outline of the cutting-guide was impressed on each, it became evident that A. was at fault. He therefore lost his plates, and had to pay the expense of an arbitration.

The other day Mr. Cobb showed us the camera-stand he used for his celebrated pictures of London taken from the top of an omnibus. It consists of a kind of table-top, one edge of which is strapped to the edge of the omnibus rail, while a single leg, adjustable as to length, serves to steady it. The table-top consists of three thicknesses of wood, so as to allow of a rotary movement on a central pin, and a hinge action of the upper board.

Enlargements upon canvas to serve as a basis for portrait-painting are sometimes objected to by the artist, because of the dark outlines printed by photography. A painter is used to black outlines, it is true, but these are made by charcoal, which are easily removed where unnecessary. But the lines printed by photography cannot thus be removed, at any rate without difficulty, and sometimes they are not easy to cover up by pigments. In these circumstances, it is not strange to find that in Paris there are painters who prefer to sketch the photographic outline themselves in charcoal, throwing a lantern enlargement from a small cliché upon their canvas.

The plan has the two-fold advantage that you do not sketch in any photographic trait that the artist thinks is best left out, while, again, the canvas has not undergone any process, and its surface is that which the painter prefers. A good paraffin lantern gives plenty of light for the purpose, and the painter has simply to darken his studio whenever he desires to study his photograph. The plan

may be in use by our English portrait painters, but we have not heard of the fact.

The demand for glass transparencies for the stereoscope is not so great as it was. The charming productions of Breese and of Ferrier et Soulier, costly as they were, found many purchasers. But they are seldom seen now, like the beautiful albumen printing process by which they were produced. Soulier was a noted painter, as well as photographer—nay, successful as he was, he never had his whole heart in photography—and he parted with his interest in the beautiful glass slides, as our readers know, to M. Léon Levy. Unfortunately, a large number of the negatives were destroyed by fire at the time of the Commune, and were to a large extent irreplaceable.

Patent Intelligence.

Application for Letters Patent.

7974. Herbert John Haddan, of the firm of Herbert and Company, Patent Agents, 67, Strand, Westminster, Civil Engineer, for "Improvements in the production of printing plates or blocks by photographic means."—A communication to him from abroad by Heinrich Riffrath, Gladbach, Germany.—Dated 20th May, 1884.

Notices of Amendment.

In the matter of Letters Patent granted to Richard Brown, Robert William Barnes, and Joseph Bell, on the 15th March, 1883, No. 1380.

Notice is hereby given, that leave has been granted to the said Richard Brown, Robert William Barnes, and Joseph Bell to amend the Specification filed in pursuance of the said Letters Patent in the manner set forth in the Official Journals of the Patent Office, published on the 1st and 4th April, 1884, pages 1062 and 1092 respectively; and that the said specification has been amended accordingly.—Dated this 22nd May, 1884.

In the matter of the application for Letters Patent made by George Duncan Macdougald, No. 416, Dated 2nd January, 1884.

Notice is hereby given, that leave has been granted to the said George Duncan Macdougald to amend the specification accompanying the said application in the manner set forth in the Official Journal of the Patent Office of the 11th April, 1884, page 1159, and that the said specification has been amended accordingly.—Dated this 22nd May, 1884.

Specification Published during the Week.

1898. Charles Sands and John James Hunter, both of 20, Cranbourn Street, Leicester Square, in the county of Middlesex, Photographic Apparatus Manufacturers, for "Improvements in the construction of photographic cameras." *Provisional specification.*

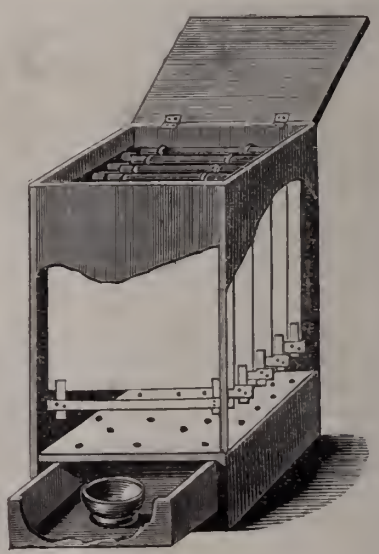
The object of this invention is to render cameras adjustable in a superior manner, and to afford increased facilities for working the same. In carrying out our invention, we so mount the cradle that it can be placed at any part of the base-board and at any angle thereto that may be required. The camera can be fixed upon the cradle either horizontally or vertically. We use either a rigid base-board or one extending and folding either at the front or back by means of screw, rack or clamp: upon this base-board is placed the cradle or double-action swing. The cradle can be made of either one or more pieces of wood working on a centre or otherwise; the top piece of wood being slightly rounded underneath and working on a pivot, ball, or ball-and-socket. To facilitate the rocking and swinging of the cradle we use a double action rack-and-pinion movement, one pinion working through the head of the other; this is arranged in the following manner, viz.:—there is fixed on each side of the bottom board of the cradle a piece of brass with a slot or elongated hole therein, through which is passed the double pinion; working in suitable racks attached to the cradle which can thus be adjusted by simply moving either of the pinion heads; the racks are fixed to the cradle, one on each side. The cradle can also be worked by means of a screw, pin, or clamp, and can also be fixed by clamp or other fastening. The camera can be fixed on this cradle either horizontally or vertically by means of a spring screw, nut, bolt, or any other convenient means, and can thus be made to swing in any direction. The front of the camera can also either be fixed or made removable to any part of the base-board, and the bellows also is so arranged that it will revolve on the front, or can be taken out and turned in any direction. The swing cradle can be adapted to any ordinary camera.

The final specification indicates in detail the method of constructing the double swing back, and is accompanied by ten drawings.

FUMING THE SILVERED PAPER WITH AMMONIA.

BY DR. PAUL E. LIESEGANG.

This operation is not exactly essential—indeed, it is generally dispensed with—but by adopting it the following advantages are realised. The printing is more rapid and more brilliant, while the pictures tone more readily. He who will profit by the advantages must not mind the small labour involved in toning, and should take a wooden box of the required size, and must provide it with a properly-hinged and well-fitting cover. About six inches from the bottom is to be fitted a perforated board, as shown in the drawing, only it is well to make more holes in it than are indicated by the sketch, excepting in the central portion. Under this false bottom a drawer is placed, a portion of the front of the box being cut away



for the purpose, and in this is placed a saucer containing strong ammonia. The paper must be quite dry, but as in this condition it tends to roll up, it is as well to attach a wood slat to the lower edge of each sheet, by means of two American clips. In the upper portion of the box a number of cross-bars, upon which the sheets can be clipped or pinned, are provided. These may be about three inches apart.

The sheets may remain between ten and fifteen minutes in the fuming box; but a longer time is required if it has been sensitized upon an acid bath than upon a neutral one, and in winter a longer time is required than in summer. It is also well to fume longer in bright weather than in dull, and also when weak negatives are to be printed; and as the ammonia tends to make the paper a little damp, it

is necessary in wet weather to re-dry the paper before placing it in the copying frame; but in dry weather the slight amount of moisture taken up from the ammonia is advantageous.

It should be noted that it is advisable to print a little deeper on fumed paper than on unfumed; and as the fumed paper becomes yellow very soon, it should be used as soon as practicable. At the same time, it is often desirable to allow the paper to remain exposed to the air for ten or fifteen minutes, in order that the excess of ammonia may evaporate, as otherwise the varnish might be softened.—*Liesegang's "Silber-druck."*

TAKING A PHOTOGRAPH BY THE MAGNESIUM LIGHT.

Taking portraits at night by the electric light is now a matter of every-day occurrence, and has many advantages, but as an experiment it is too expensive for the amateur photographer to undertake.

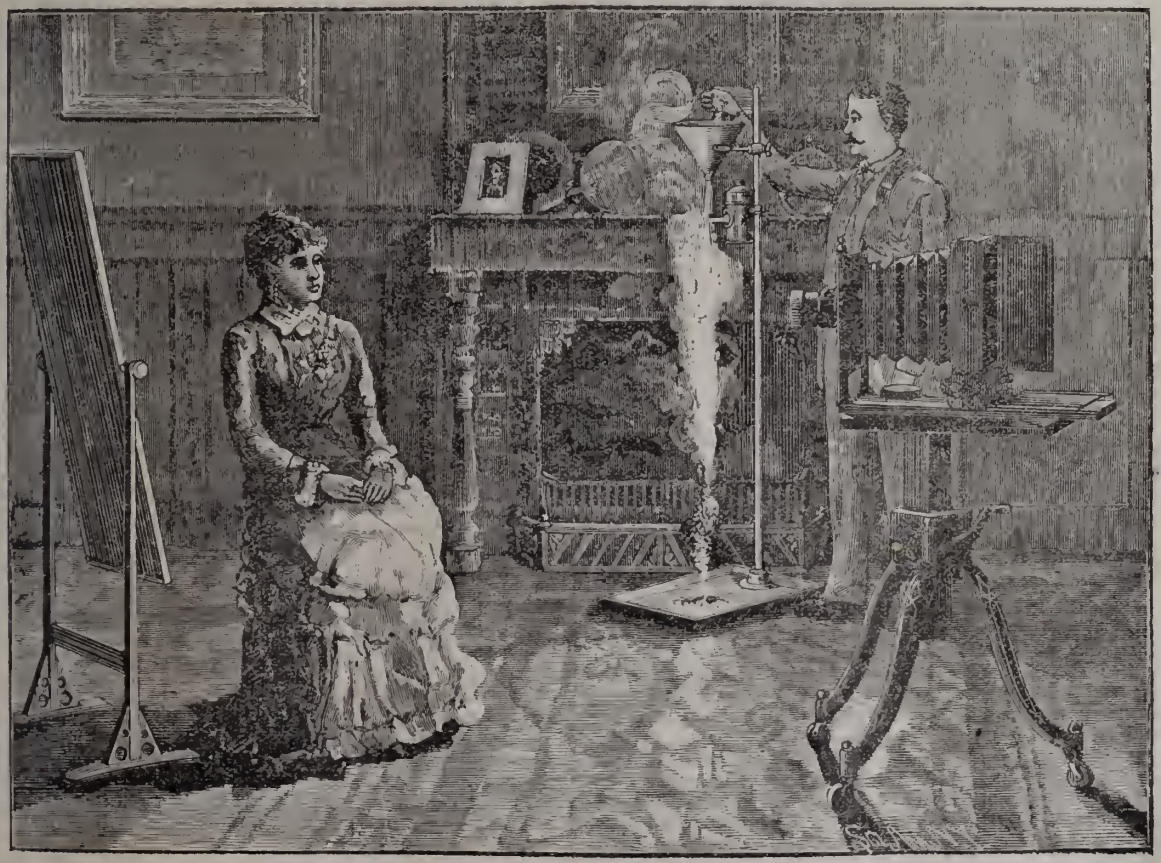
Our engraving illustrates a novel and easy method of photographing by the aid of the magnesium light. If a magnesium ribbon of a certain length be used, the ash will sometimes drop, and suddenly extinguish the light.

This difficulty may be overcome by the use of magnesium powder mixed with fine sand. Upon a metal or wooden rod six or eight feet long is clamped an alcohol soldering lamp capable of giving a large horizontal flame, and above it a funnel of tin or brass with a short mouth about three-quarters of an inch in diameter. The lamp should be quite close to the funnel; the rod may be secured at the bottom to any suitable base of wood or metal, and may rest upon a table instead of the floor. A pan or dish set upon the base will catch any falling particles.

The proper focus may be obtained by focussing upon the flame of a candle placed where the person is to sit. The shadows are softened by reflecting the light with a white muslin screen secured to a frame, which may be tilted at any angle, as shown. No cap is used on the lens.

One thimbleful of magnesium powder is mixed with two of fine sand, with a spoon or piece of wood, upon a white sheet of paper.

To make the exposure, the operator, after fixing the sitter in position, and drawing the slide of the plate-holder, simply steps up to the funnel, and quickly dumps the magnesium mixture into it The alcohol lamp sets fire to the magnesium, as it, in falling, comes in contact with the flame, and a long, brilliant, dazzling sheet of light, lasting for a second or two, is the result. Such a brief exposure is gene-



rally sufficient. The duration of the flame can be regulated by the addition or subtraction of the magnesium or sand.

Should a picture be over-exposed, the duration of exposure can be shortened by the addition of a little sand and a corresponding diminution of magnesium powder. If a larger amount of magnesium is used in proportion to the sand than that stated, the light will be more brilliant and of short duration. By varying the proportions of the two, it is possible to produce a flame of light from six to seven feet in length.

The large area of the light tends to diffuse the same, softens the shadows, and gives the picture a brilliant effect.

By varying the position of the light, very artistic effects of light and shade may be produced. The sitter should be placed so as to look away from the point where the light is to appear, in order that the dazzling effect of its intense glow may be avoided. Once the proper proportion of magnesium powder has been ascertained, several exposures may be made one after the other, with the certainty of obtaining good pictures each time.

As an experiment, nothing can be more attractive and entertaining than taking a photograph at night.—*Scientific American.*

THE EFFECT OF SHEARING STRESS ON A SENSITIVE SALT.

BY CAPT. W. DE W. ABNEY F.R.S.

AT the last meeting of the last session of the Photographic Society I gave a paper on the above subject, which, at the time, was commented upon, both in the PHOTOGRAPHIC NEWS and in the *British Journal*. In the latter journal the effect was laid to an abrasion of the film, and not to stress on the particles of silver bromide. Since that time I have carried on a few experiments on the subject, the results of which seem to point to a different conclusion. When writing paper was placed between the film and the writing point, though an image of the markings developed with apparently no abrasion, yet it might be due to two causes: one to organic matter from the paper pressed into the film, or to the fact that an abrasion might have taken place imperceptible to the eye. In order to test what effect abrasion really had, a gelatine plate was marked with a point, and a small amount of abrasion could be seen; it was then placed in water and soaked for a few minutes, after which it was placed near a hot water bath till the surface of the gelatine had melted, and no trace of any rupture in the gelatine could be traced. It was next allowed to set and dry, and then developed. The phenomena I have described in my last paper presented themselves as before; but a remarkable thing occurred, viz., that the developed writing was as sharp as if the surface had remained unaltered by melting. This pointed to the fact that the real effect was produced below the abrasion. To test this, a plate was written on as before, and the gelatine melted to the very surface of the plate, and a gentle rocking given to it to displace the sensitive salt next the glass. The gelatine was allowed to set again, and then developed. In this experiment the writing was thickened and distorted, showing that the seat of the phenomenon had been reached. I may remark that in the first described experiments, the plate was also rocked when the surface gelatine had melted, and this gave me an idea in what direction further search ought to be made. The destruction of the writing took place, as in my before described experiments, by the application of bichromate of potash to the plate. We have here, then, a further step in tracking this curious phenomenon to its source, and is in support of shearing stress excreised on the sensitive salt of the film, as against mere abrasion, since the altered sensitive salt was below the abrasion.—*Photographic Journal.*

CITY AND GUILDS OF LONDON INSTITUTE FOR THE ADVANCEMENT OF TECHNICAL EDUCATION.

THE Technological Examination for 1884, in Photography, took place on Wednesday evening, the 28th inst., at the various centres appointed.

The number of candidates who were examined last year was larger than either of the previous examinations; about forty certificates, besides several medals and money prizes, being awarded in the "Honours" and "Pass" grades. We have good reason for saying that these figures will be considerably augmented this year; nearly fifty students taking photographic question papers in one centre alone. The results will be made known in August next.

The examination consists of two grades, Ordinary and Honours, Certificates (first and second class) being awarded in each grade.

Prizes.—Honours.—1st prize, £5 and a silver medal; 2nd prize, £2 and a bronze medal. Ordinary.—1st prize, £3 and a silver medal; 2nd, £3 and a bronze medal; 3rd, £2 and a bronze medal; 4th, £1 and a bronze medal; 5th, a bronze medal.

The following are the instructions and questions given by the examiner, Captain Abney, F.R.S.

Instructions.

The Candidate must confine himself to one grade only, the Ordinary, or Honours, and must state at the top of his paper of answers which grade he has selected. He must *not* answer questions in more than one grade.

If he has already passed in this subject in the first class of the Ordinary Grade, he must select his questions from those of the Honours Grade.

The number of the question must be placed before the answer in the worked paper.

Three hours allowed for this paper

Ordinary Grade.

1. In wet-plate photography the solution of silver nitrate is left on the sensitive film. What is its action (1) during the exposure of the plate, (2) during development?

2. Silver prints on albumenized paper sometimes appear dead and sunken in. To what causes may this be due?

3. Give an outline of the method of producing prints by the Woodburytype or the stannotype process.

4. Wishing to test the strength of the silver nitrate bath, I take half-an-ounce of the liquid and add dilute hydrochloric acid to it till no further precipitate is formed. After carefully washing the precipitate and drying it, the silver chloride is weighed, and found to be 47½ grains. What was the strength of the silver nitrate solution?

Ag = 108
N = 14
O = 16
Cl = 35·5

5. Gelatine is rendered insoluble in warm water (1) by the action of light on bichromate of potash when mixed with it and dried, and (2) by the addition of chrome alum. Is there any difference in the properties of the gelatine thus rendered insoluble?

6. Describe the method you would adopt to practically ascertain the comparative rapidities of two plates.

7. Explain as fully as you can the use of stops in a lens.

8. Bromide, iodide, and chloride of silver are given a lengthened exposure to sunlight; (1) in the presence of silver nitrate solution; (2) in the presence of a solution of sulphite of soda; (3) dry, after being thoroughly washed. Describe the appearance of each silver compound before and after the exposure in each of the three experiments.

9. Describe briefly the theory of the development of the photographic image when an alkaline developer is used.

10. Describe the production of a photographic transfer for lithography.

Honours Grade.

1. State what you know regarding the cause, and the cure for green fog in a gelatine emulsion.

2. After very carefully focussing a fine engraving on the focussing screen of the camera, a negative is taken and found to be wanting in sharpness. To what causes may this be due, and how should you ascertain the cause? Can the defect be practically eliminated, and if so, how?

3. Describe the method you would adopt for ascertaining the range of graduation of a gelatine plate.

4. Plates prepared with collodio-bromide emulsion are briefly exposed in the presence of tannin, beer, silver nitrate, mercuric chloride, bichromate of potash, and potassium nitrate respectively. What would be the results on development?

5. Describe Fox-Talbot's process for producing a positive instead of a negative in the camera, and state the theory on which it depends.

6. Describe the process you would employ for producing gelatine chloride plates, and the method you would adopt for developing them.

7. What are the theoretical and practical disadvantages of using a pin-hole stop in a lens.?

8. In the collodio-chloride process, what part does the citric acid play?

9. How should you practically test the suitability of different coloured media as screens with which to cover the window of the dark room?

10. Is the light transmitted and reflected from coloured paper the same? Give in detail the reasons for your answer.

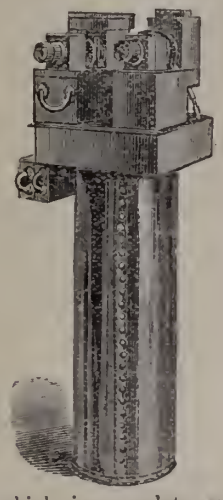
Correspondence.

THE IVES ETHOXYGEN APPARTUS.

SIR,—My oxyhydrogen jets have no "safety" contrivances about them, but work perfectly with the patent ether saturator, and the flame never "snaps" in dissolving. The ether light can best be produced with a jet having small tubes, small mixing chamber, and not very

large aperture tips. The jets in the market here all have too large mixing chambers, and most of them too large supply tubes; and the manufacturers would rather condemn the use of ether, than to make their jets right to work with it.

I send you a small photograph of my own dissolv-



ing view outfit, which is complete and powerful, but remarkably compact. The steel oxy-cylinder is 40 inches high, and holds 80 feet of gas at a pressure of 220 lbs. to the square inch. It serves me also as a stand for my lanterns, which are my own make, and can be folded up in thirty seconds, so that each forms its own "carrying case," and measures only 5½ × 6 × 8½ inches. The condensers are 4½ inches diameter, and the objectives about 4 inches back focus, with rack-and-pinion. The table-top attachment to the cylinder, together with both lanterns, the ether saturator, two boxes of slides (100), and an extra pair of objectives, all pack into a small trunk.

I have never seen any other outfit equally powerful which could be packed in *twice* the space.—Respectfully yours. FRED. E. IVES.

Philadelphia.

THE ILLUMINATION OF THE DARK-ROOM.

DEAR SIR,—As the discussion upon my paper on illumination of the dark-room, read before the Photographic Society of Great Britain, stands adjourned until the next meeting of the Society, I should have preferred to keep silent till that occasion, but that an article in which my name is mentioned, contained in your last impression, by Mr. C. Ray Woods, who has expressed his intention of joining in the discussion and of criticising my paper, appears to me to call for reply in the same medium as that in which it appears.

In the article referred to, "Illumination of the Dark-room," page 333, Mr. Woods says that "it can readily be shown that the spectroscopic test is one that can safely be relied upon, and is superior to the somewhat haphazard methods more frequently adopted." It is rather difficult to see why the method which I adopted and exhibited at one of the technical meetings of the Society last autumn, and which consisted of a direct comparison of the luminous effect of colours with their protective power upon the photographic plate, should be called a haphazard one. By this method the three elements to be considered—illuminating power, protective power, and irritating or comfortable character of the lights to be considered—can be directly compared without the complications which ensue when using a purely spectroscopic method. The powerful effect, for instance, of any of the ultra-violet rays which may pass through any given medium will be at once shown by the direct experiment method, whilst to the eye of the spectroscopic observer they are unperceived. And even if spectrum photography be called in aid, the comparison with photographic illuminating power is by no means so easy and precise as with the direct method. If, as Mr. Woods states, it can be so readily shown that the spectroscopic test is really superior, he certainly has not shown it.

For the argument from the spectrum to be sufficient of itself, it would be necessary, in the first place, that the facts of spectrum photography should be established and beyond dispute. The differences, however, that exist between the results of different observers show that this has not been done. To take only the diagram with which Mr. Woods illustrates his article, he makes the action of the spectrum upon bromide of silver entirely cease near line C, about the middle of the red, whereas it is generally conceded that at least the whole of the visible spectrum has its photographic effect. If this diagram were correct, the question of safety would indeed be settled, as any amount of red about the region of B might be used with perfect impunity.

Another difficulty which occurs when using the spectroscopic test, is that of determining the relative illuminating value of the different rays. This difference of illuminating powers has indeed commonly been ignored when using the argument from the spectrum, but as you have, in your article on page 321, so powerfully pointed out the absurdity of this omission, it is not necessary to say more on that head.

Mr. Woods complains of "loose talk" about "supposed discrepancies between spectroscopic evidence and ordinary practice." I have never spoken disparagingly of the "evidences" of the spectroscope. If what is called the argument from the spectroscope is not in accordance with observed facts, the presumption is not against the instrument, but that either the assumed facts of spectrum photography have not been correctly ascertained, or that the deductions from the facts have not been properly made. Speaking of "loose talk," however, what is to be said for Mr. Woods' persistence in speaking of certain glass that I employed as cathedral green? Cathedral is the name of a "make" of glass, and, as I have repeatedly mentioned, I selected it merely because it happened that I could not get at the time the colour I wanted, a yellow-green, in any other make. Cathedral glass may be had in a great variety of colours; in the greens there are light-greens and dark-greens, blue-greens and yellow-greens. I have given many patterns of the colour I used, light and dark, to any photographers who have wished for them, and I should have been happy to furnish Mr. Woods with a sample also. It would seem, however, from the fact that in his diagram, fig. 10, of what he calls "cathedral green" shows a spectrum nearly like No. 8, which he speaks of as green "almost a blue," and very unlike No. 9, a yellow green, that he has happened upon a piece of bluish rather than yellowish-green glass.

In speaking of "stained red" glass, Mr. Woods says that that used by Captain Abney is stained red on one side and yellow on the other. It would be interesting to know what is the recognized name of glass thus prepared. The several samples that I have obtained bearing Chance's printed label "stained red," have been very much alike, and are heavily stained on one side with silver. This may be tested by dissolving a portion of the surface away with fluoric acid, when the yellow colour of a thinner film is evident.

In a former article on page 214, April 4th, Mr. Woods gives a diagram representing the sensitiveness of green bromide of silver as greater to the red ray of the spectrum, than to the yellow. The sensitive compound that photographers use in gelatine plates has been described as the green bromide, and if this diagram is to be relied on, therefore, spectroscopic evidence would be powerfully in favour of yellow as the illuminant of the laboratory. If (of which there is no indication in the article) there is any special preparation of green bromide necessary in order to produce this result, will Mr. Woods furnish the precise formula. The value of a statement on a scientific subject depends

upon its being accompanied by the details necessary for its examination and verification.

In spite of the demonstration that I gave of the fact that green glass is a more powerfully protective supplement to stained red than cobalt is, Mr. Woods states that those who work with the latter in combination, "will be using that portion of the spectrum which possesses the least reducing power"; whilst of the green he states that those who use it weaken the illuminating power of the light in much greater proportion than they increase its safety. Mr. Woods has, by his own statement and that of Captain Abney, an extraordinary facility for seeing with red light. The observers whom I have had the opportunity of testing, Mr. W. K. Burton, Mr. J. Cadett, Mr. A. Haddon, and Mr. J. Traill Taylor, all found that to them the combination of green and stained red, that gave so much more protection to the plate than the stained red and cobalt, gave from three to four times as much illuminating power, and was of more agreeable character. It is not probable that all these gentlemen were exceptionally averse to red, but would more probably represent the average or normal state of vision.

On the Editor's article on my paper, I would only make one comment. It is said that "Mr. Debenham appeared to fail to make out a case in favour of yellow light as against that filtered through 'stained red' glass, except that red colour is hurtful to the eyesight." I did not endeavour to make out a case against that medium upon any other ground; and for the reason I pointed out—namely, that stained red is only a pile of yellow, I stated that it was not surprising that it shows as of about the same safety as another yellow. When a real red, such as the copper-stained ruby, which, when in thin layers, shows still as red, and not as yellow, is tried in comparison with a yellow light, the superiority of the latter is seen; and in the battle of yellow light *versus* red, it is certainly a point in favour of the former, if for the representative red medium, one has to be selected which only appears to be red from the fact of its being in a very thick layer, and which is brilliant yellow in a thinner layer.—I remain, yours, &c., W. E. Debenham.

Proceedings of Societies.

Photographic Society of Great Britain.

A meeting was held in the Room attached to the Gallery, 5A, Pall Mall, East, on Tuesday last, the 27th instant, Captain W. de W. Abney, F.R.S., in the chair.

Mr. Sebastian Davis referred to the fact that there had been a notable tendency towards a falling off as regards the brilliancy or vigour obtainable on gelatine plates, and he could not deny the fact that, notwithstanding much endeavour, he had not been able to satisfy himself as to the reason of this falling off. That "sparkle," to use the expression of Mr. Payne Jennings, which results from a full series of gradations ranging from bare glass to a sufficient maximum of density, constitutes the principal charm of a photograph; and every effort must be made to acquire the knowledge requisite to ensure this. At first Mr. Davis thought that the tendency towards weakness might result from an imperfect removal of the nitrate salts by washing, but this was found not to be the case, as little or no advantage resulted from prolonging the washing beyond the usual amount. Details were then given as to the method he adopted in preparing his emulsion. The proportion of gelatine with which he emulsified was usually eight grains to the ounce, and he was in the habit of adding twenty-two grains afterwards; ordinarily he used Heinrich's "hard," although he had frequently made use of other sorts.

The Chairman here remarked that he had found the proportion of gelatine present during emulsification to very materially influence the sensitiveness; the emulsion being made quicker by increasing the quantity of gelatine added in the first instance. He then enquired of Mr. Davis as to the colour of his usual emulsion.

Mr. Davis said it was ordinarily a greenish-violet; but as small a quantity of iodide as one grain to the ounce seemed to communicate a yellow tint. In order to try to obtain more density, he had used gallic acid, having found this reagent very valuable for a similar purpose in the case of the collodio-albumen process; but no advantage resulted. He had used the gallic acid by making up the volume of the emulsion with a saturated solution—say 2 ounces of the solution to the batch of 10 ounces of emulsion; but no advantage resulted.

Mr. Warnerke spoke of the value of isinglass for emulsion making, and said that it could be distinguished from ordinary gelatine by the fact that it (isinglass) became opalescent when soaked in water, the opalescence being generally accompanied by a greenish appearance. A cheap article is made in Russia by boiling up all the more solid parts of the fish; while the genuine isinglass is well known to be made only of the sound or air-bladder.

The Chairman had met with instances in which ordinary gelatine became opalescent when soaked in water.

Mr. Warnerke stated that the quality of the gelatine had considerable influence on the sensitiveness of an emulsion, and great difficulty arose from the impossibility of getting two samples alike, the ordinary practice being to order large batches, and to thoroughly experiment with them before venturing to use them.

Mr. Davis enquired whether the bromide of potassium was to be preferred to the ammonium salt?—and

The Chairman said that the difference was not great, but perhaps the use of potassium salt was conducive to density.

Mr. Davis remarked that Mr. Wilson, in his directions, had insisted on the importance of using a special bromide, which was only to be obtained at a certain shop.

A general conversation here ensued as to the special advantages to be realised by obtaining special brands of bromide; but it was subsequently pointed out that potassium bromide may be regarded as a constant, if only reasonable precautions are taken to obtain it in a pure state, and it was stated that by adoptiug the well-knowu principle of fractional decomposition, bromine perfectly free from other haloids could readily be obtained.

Mr. Warnerke remarked on the fact that German bromine is often contaminated with iodine and chlorine.

The Chairman referred to a very ready way in which iodine might be removed from bromides—viz., by fractional precipitation with silver nitrate, the iodine being, of course, thrown down first. As regards chlorides, they were, perhaps, of less immediate importance; although he might mention, as quite an exceptional case, that he had known a sample of bromide of potassium to contain one-third or one-fourth of its weight of chloride. This was, however, clearly a case of adulteration. He considered that the subject of the purity of haloid salts was of vital importance, and he would be glad to see a committee of the Society formed to deal with the question.

The importance of considering and duly studying the condition under which fine deposits were obtained was next referred to by the Chairman, and he said that he had found, when dense images were obtained, that the grain was fine and tolerably regular. A thin-image plate shows, on the other hand, a coarse and irregular grain. It is a matter of importance to secure a fine grain when accurate measurements are to be made; and it must be remembered that he had carried some of his measurements so far as to recognize the 200,000th of an inch. With a quarter-inch objective, it is possible to obtain readings to the 100,000th of an inch; while much good work may be done with a one-inch power, but in this case it is difficult to read beyond a 10,000th.

Mr. Warnerke enquired if any members had tried the effect of dissolving magnesium wire in the oxalate developer according to a suggestion made by Captain Abney. He had found a remarkable increase of activity to result, and denser pictures were obtained than when the ordinary developer was used. The speaker then referred to the circumstance that Mr. Levitzki, of St. Petersburgh, adds tartaric acid to his old oxalate developer, and runs it in tall clear bottles. It is thus obtained in fine condition for copying work, and gives negatives of great intensity. Mr. Warnerke then referred to the use of the collapsible metal tubes, ordinarily used for artist's colours, as vessels for storing small doses of developer, and indeed many other photographic chemicals or preparations, more especially printing inks for the collotype process. He also spoke of a new accelerator sold by Carrette. It is a colourless liquid, smelling of acetic acid, and if poured over a plate before development it appears to have the same effect as would have resulted from a more prolonged exposure.

A general conversation regarding the use of the potash developer then followed, and Mr. England said that he finds that pyrogallic acid keeps very much better if dissolved in absolute alcohol than in spirit of the usual strength.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 22nd inst., Mr. J. H. Hare in the chair.

A communication from the Balloon Society was read, inviting the members of this Society to attend with their cameras, to photograph the balloons in the Crystal Palace grounds on the 31st inst.

Mr. A. Cowan showed a photograph of an ordinary four-wheeled cab he had used as camera-stand, dark-room, and changing-box combined. By lining the inside as well as covering the outside, it was rendered perfectly light-tight, one dozen 12 by 10 rapid plates being changed within in safety.

Mr. W. E. Debenham said he intended showing the effect of a composite white light, but was prevented through breaking one of the glasses, so would defer it until the next meeting. He said one of the difficulties met with when photographing interiors, was hitting the proper exposure; the advantage of being able to develop a trial plate on the spot was very great. He then showed a convenient tent for changing or developing plates. This consisted of a shallow tin dish, thirteen by eight inches, as a base, a frame of stout wire, the same dimensions with two folding supports, eight by eight inches, the whole being covered with black fabric, in which two sleeves were placed. Mr. Debenham demonstrated the safety of this tent by changing and developing a plate; he said that it was important to pass a soft brush freely over the plate during development, to prevent irregular action, through the inability to watch the progress of development. The tent was large enough for changing or developing half plates.

Mr. A. L. Henderson considered the graphogenic camera designed by Mr. Edwards would answer well for testing plates, especially if ferrous oxalate development were employed.

Mr. A. Cowan said Mr. Harrison's idea was a good one; he made a small camera for exposing and developing inch plates as a guide, making the allowance for lenses of larger dimensions in calculating the correct exposure.

Mr. Henderson passed round two plates of the same batch, exposed under the sensitometer for ten minutes, eight inches from his new lamp, the illumination being the same.

The general opinion was, that one plate was six times more affected than the other.

Mr. Henderson said he used a small paraffine lamp, the light being passed through a disc of plain glass containing four surfaces, and two plates of aurine in the case of the most affected plate; whereas, in the least affected, a diffraction gratiug was substituted for the plain glass. The diffraction grating was made for him by Messrs. C. and F. Darker, who would answer any queries respecting it.

Mr. A. Haddon enquired how many lines Messrs. Darker employed per inch?

Mr. C. Darker replied that there was three thousand in the one shown.

Mr. W. M. Ashman enquired what would be the size of the largest disc and diffraction grating capable of employment with a larger flame?

Mr. Darker said about two inches, which would be very expensive.

Mr. Henderson remarked that a firm in Philadelphia advertised diffraction grating as large as five inches.

Mr. C. Ray Woods said there were some Roland gratings at South Kensington six inches long by two inches broad; these came from America.

The Chairman exhibited a rapid shutter for attaching outside the lens; by means of a small lever, the metal disc is raised and released by a rubber band being thrown off, the disc descending with a speed which is regulated by the tension of an adjustable spring.

Talk in the Studio.

Removing Hyposulphite from Gelatine Films.—A trace of hyposulphite remaining in the gelatino-bromide film has caused the destruction of many a good negative; and the means of removing this deleterious agent, referred to by M. Felisch at a recent meeting of the Russian Technical Society, may be worth consideration. He makes a bath with about equal parts of iodide of potassium and iodine dissolved in water, so as to make a solution having about the tint of port wine, and the washed plate is allowed to remain in this for a few minutes, a final rinse in water being all that is then required.

Pigment Tissue for Enamel Pictures by Pavloffski's Method.—It is said that Herr Romain Talbot, of Berlin, has introduced into commerce a pigment tissue for making photo-enamel pictures according to the method of Pavloffski (page 193). Lieutenant Pavloffski has now adopted the simpler method of spreading the mixture of gum and enamel colour on paper rather than a plate of metal, and he prefers to sensitize afterwards instead of mixing the bichromate with the gum in the first instance. A mixture of gum and pigment is made precisely as described (page 193), only the bichromate is omitted and less water is used. This gum mixture is spread evenly on stout paper, dried, and it is sensitized just like ordinary carbon tissue, but it is necessary to use a bath containing alcohol in order to prevent the dissolving of the gum. The following is the formula:—Potassium bichromate, 2 parts; water, 50 parts; 90 per cent. alcohol, 50 parts. The remaining operations are similar to those in the ordinary Swan's carbon process, only alcohol must be used when required to prevent the solution of the gum. For coating the paper, a gumming machine may be used, and one constructed by M. E. Ravasse, in Paris, is recommended.

Reducing the Intensity of Negatives.—Mr. Belitzki makes use of the greenish crystals which are deposited from old oxalate baths. He dissolves 3 parts of these in 100 parts of the usual hyposulphite fixing bath, and he finds that if a recently-fixed negative is immersed in this solution, and meanwhile exposed to a full light, a gradual and very satisfactory reduction of the density takes place. The reducing bath keeps well in the dark.

The "Daily Telegraph on Photography.—In an article on the Derby day the *Daily Telegraph* says:—"Who can fail to experience regret that some such recourse to instantaneous photography as was adopted last Sunday, and on many previous occasions, at Chantilly and other French racecourses, was not within the reach of our forefathers? It is reported from Paris that the late starter, who was formerly employed as an official by the French Jockey Club, has reveuged himself for his dismissal by taking a series of instantaneous photographs of his quondam masters, and of the scenes which are witnessed at the starting-post on the eve of a great race. Occasionally a jockey is revealed in earnest confabulation with some trusted commissioner, who receives his latest inspiration from 'the man in silk,' while, in the words of a contemporary, 'several of the photographs have been printed, and others suppressed as telling too many tales. Were it possible for the lens and camera of the photographer to reproduce all the unpublished histories of which Epsom racecourse has been the scene within the last century and a half, we doubt if there would be enough collodion in the world for the purpose." What a pity these writers do not read up a little before venturing into technicalities! Collodion would not do it, and the sooner the *Daily Telegraph* writer knows it the better. His idea is good and perhaps some day, Derby pictures will be produced equal in conception to Frith's celebrated painting.

Photographic Club.—At the next meeting on June 4th, the subject for discussion will be on "The consideration of the best means of obtaining Density in Gelatine Plates without resorting to intensification." An out-door meeting will be held on Whit Monday at Welwyn; train leaves Kings Cross at 10.32.

To Correspondents.

*** We cannot undertake to return rejected communications.

W. Evans.—We are sorry to have to admit that you are right. It is painful to find such a condition of things existing.

J. W. P.—We gather from your letter that your assistant has used you badly, and that you suspect him of having taken photographs from your establishment; but you are unreasonable in expecting us to publish his name and description, especially as you wish to cover your own identity under a *nom de plume*.

J. H. N.—You can perhaps understand that to do so would be a little painful just now, but the matter shall be considered, and we thank you for the kind expressions in your letter. At any rate, we will endeavour to obtain one for you.

Charles Cranch.—1. The manufacturers are Messrs. Chance and Co., of Birmingham. 2. We have found it excellent, but should recommend you to use two thicknesses.

G. F. Webber.—1. A formula suitable for citro-chloride emulsion will he found on page 161; the same, in fact, that we recommended for pictures on opal. 2. We quite agree with you, but can hardly make the suggestion to the firm you mention; hut you might write as one interested in seeing such an article introduced into the market. 3. As regards the lens, we are inclined to think that your friend will now have to make the best of his bargain. Whether it will be worth whilo to have a new front glass constructed by the original makers is a matter upon which they only can advise.

J. G.—If we were to do as you suggest, it would he solely in the interest of our readers. We will enquire into the matter, and shall he glad to have any particulars you may he disposed to send.

W. Field.—In order to fairly deal with the question from your point of view, you require the judgment and experience of one who has not only made a special study of the matter, but who is also acquainted with the conditions under which you intend to work. No one process can be simply designated as "best," hut we are inclined to think that if you intend to make blocks yourself, you had hetter adopt either the Asser process (p. 259 of our volume for 1883), or the Ives' method. Concerning the latter, much information will be found in the News during the past eighteen months. Several of the best methods are covered by patent rights, or are not made public. We could, perhaps, help you more if we knew what experience you have had hearing on the matter; but under any circumstances, you would do well to obtain Husnik's "Heliographie," published by Hartleben, of Leipzig. The cost is only a few shillings, and it can be had through any foreign bookseller.

C. R. B. D.—We fancy the plate must have been under-exposed, hut if good, it should have withstood the forcing treatment, unless you fogged it by light during development. When a plate is to bo treated with an energetic developer, it becomes necessary to take especial precautions as regards the dark-room light. 2. Sometimes it will keep good for months, but it is hetter to use it freshly made. 3. Thank you for the note. It is strange how such an obvious improvement should escape observation.

S. Rousseau.—The suggestion is likely to be a useful one. We will write to you.

Pin.—1. Both the numbers are in print, and our publishers will forward them if you send the price with an additional stamp for postage. 2. We are afraid that no use can be made of it except for cleaning plates.

A. G. B.—1. Excellent work can be done with them, but they form no exception to the general rule, that a tool or appliance made to serve many purposes, is not equal to a set of tools in which each instrument is specially adapted for its own work. We cannot answer the second part of your question, as we have not the instruments at hand; but we will endeavour to ascertain. 2. You perhaps hardly grasp the point of view from which it was written; but we agree with you that it is strange that the English makers have not adopted the convenient plan to which you allude. 3. The following you must regard altogether as a personal opinion: S. F. D. H. 4. It is a dark slide in which the draw shutter is replaced by a kind of roller blind, made by gluing strips of wood on a flexible basis; the general arrangement being somewhat analagous to the revolving shutters which are used for shop windows.

M. Colton.—Captain Abney's "Instruction" is the best hook for you to obtain; but we are afraid you will have to wait a few weeks, as it is just now being reprinted.

The Photographic News Registry.

Employment Wanted.

Reception Room, &c.—Z., 18, Cardigan-rd., Bow.
Retoucher, Spotter (lady)—Y. Z., 72, Azenby-sq., Peckham.
General Assistant.—G. H. Barthorpe, 50, Victoria-st., Bradford.
Reception Room, &c.—Miss Ayre, 21, Dorchester-pl., Blandford-sq.
Copyist, Landscape, wet and dry.—X. Y. Z., *Photo. News* Office.
Operator, carbon and silver.—A. Hey, 7, Park-st., Aberdeen.
Assistant Operator, wet or dry, can copy—B., *Photo. News* Office.
Vignette Printer and Toner.—W., St. Mary's-sq., Kennington-rd.
Reception-Room & Retouching.—M. D., 46, Friern-rd., East Dulwich.
Assist. Op., Ret., Enlarger—Mr. Cubberley, c/o Messrs. Turner, Barnsbury.
Operator & R toucher, or Manager Branch.—H. Betts, 94, High-st., Merthyr.
Op. for 6 mos. at sea-side, at £3 3s.—B. B., 13 King Henry's-walk, W.
Op., Printer, Toner, Retoucher—Bromide, 133, Union-rd., Newington, S.E.
Manager & Operator.—M., Mr. Nicholls, High-st., Shanklin, I.W.
Ret., Artist in Oil, Water, Monochrome.—F. G., 3, Kenyon-ter., Clapham.

Employment Offered.

Lady Retoucher, with references.—Norman May, Malvern.
Reception-Room & Retoucher.—Artist, *Photo. News* Office.
Reception-Room Lady, good writer—Messrs. Turner, Barnsbury.
Printer & Retoucher.—Chancellor's Studio, 55, Lower Sackville-st., Dublin.
Assist. Op., dry.—Weston & Son, 23, Sandgate-rd., Folkestone.
Lad as Assistant Printer.—Boning & Small, 22, Baker-st., W.
Operator & Retoucher.—W. H. Midwinter, 49, Park-st., Bristol.
Operator, about June 10.—Marwick & Co., White Rock Library, Hastings.
Spotters & Mounters, first-class—Fradelle, Regent-st.
Enameller, at once.—Oelfelein and Co., 54, Berner's Street, London, W.

THE EVERY-DAY FORMULARY.

The Gelatino-Bromide Process.

Emulsion.—A—Nit. silver 100 grains, dist. water 2 oz. B—Bromide potassium 85 grains, Nelson's No. 1 gelatine 20 grains, dist. water 1½ oz., a one per cent. mixture of hydrochloric acid and water 50 minims. C—Iodide potassium 8 grains, dist. water ½ oz. D—Hard gelatine 120 grains, water several oz. When the gelatine is thoroughly soaked, let all porsible water be poured off D. A and B are now heated to about 120° Fahr., after which B is gradually added to A with constant agitation; C is then added. Heat in water bath for half an hour, and stir in D. After washing add ½ oz. alcohol.

Pyro. Developer.—No. 1—Strong liq. ammonia 1½ oz., bromide potassium 240 grains, water 80 oz. No. 2—Pyro. 30 grains, water 10 oz. In case of an ordinary exposure mix equal vol.

Iron Developer.—Potassium oxalate sol. (1 and 4) 80 parts. ferrous sulphate sol. (1 and 4) 20 parts, dist. water 20 parts. To each 4 oz. of the mixed developer add from 5 to 30 drops ten per cent. sol. potassium bromide, and 30 drops sol. sodium hyposulphite (1 and 200).

Substratum or Preliminary Preparation.—Soluble silicate of soda 1 part, white of egg 5 parts. water 60 parts. Beat to froth and filter.

Fixing.—Sat. sol. of sod. hypo. 1 pint, sat. sol. of alum 2 pints, mixed.

Cowell's Clearing Solution.—Alum 1 part, citric acid 2 parts, water 10 parts. Edwards makes this sherry coloured with perchloride iron.

Eder's Method of Intensification.—The negative is whitened by soaking in sat. sol. of mercuric chloride, and after thorough rinsing immersed in potass. cyan. 10 parts, potass. iod. 5 parts, mercuric chloride 5 parts, water 2,000 parts. As film becomes dark brown, the actinic opacity is increased; but prolonged action causes brown tint to become lighter, until at last the negative is no denser than at first.

Fol's Backing Sheets.—A chromographic paste is prepared with gelatine 1 part, water 2 parts, glycerine 1 part, and a very small addition of Indian ink. Strong paper or shirting is coated, and the sheets are laid, face downward, on waxed glass to set. Press to back of glass plate.

The Wet Collodion Process.

The Nitrate Bath.—Water 14 oz., nit. silver 1 oz., nitric acid 1 drop. Before using coat a small plate, and immerse it for 20 minutes.

Cleaning Preparation for New Plates.—Alcohol 4 oz., Jeweller's rouge ½-oz., liquid ammonia ½-oz.

Film-removing Pickle for Old Plates.—Water 1 pint, sulphuric acid 4 fluid oz., bichromate potassium 4 oz.

Substratum.—Whites of 2 eggs well beaten, 6 pints of water, and 1 dr. liq. ammon.

Negative Collodion for Iron Development.—Alcohol 1 pint, pyroxyline of suitable quality 250 grains, shake well and add ether 2 pints, *Iodize this by mixing with* one-third of its volume of alcohol ½ pint, iod. ammon. 80 grains, iod. cadm. 80 grains, brom. ammon. 40 grains.

Normal Iron Developer.—Water 10 oz., proto-sulphate iron ½ oz., glacial acetic acid ½ oz., alcohol ½ oz. The amount of proto-sulphate iron may be diminished to ¼ oz. when full contrasts are desired, or increased to 1 oz. when contrasts are unduly marked. With new bath quantity of alcohol may be reduced to ¼ oz; but when bath is old more is wanted.

Intensifying Solution.—Water 6 oz., citric acid 75 grains, pyro. 30 grains. When used, add a few drops of the silver bath to each ounce.

Lead Intensification.—After neg washing, immerse in dist. water 100 parts, red pruss. potash 6 parts, and nit. lead 4 parts. When it is yellowish white wash and immerse in liquid sulphide ammon. 1 part, water 4 parts.

Fixing Solution.—1. Potass. cyanide 200 grains, water 10 oz. 2. Sat. sol. of sod. hypo.

Varnish.—Shellac 2 oz., sandarac 2 oz., Canada balsam 1 dr., oil of avender 1 oz., alcohol 16 oz.

Printing Processes.

Albumen Mixture for Paper.—White of egg 18 oz., 500 grs. ammon. chlor. in 2 oz. of water. Beat to a froth, stand, and filter.

Sensitizing Solution.—Nit. silver 50 grs., water 1 oz., sod. carb ½ gr.

Acetate Toning Bath.—Chl. gold 1 gr., acet. soda 20 grs., water 8 oz.

Lime do.—Chl. gold 1 gr., whiting 30 grs., boiling water 8 oz., sat. sol. chl. lime 1 drop. Filter cold.

Bicarbonate do.—Chl. gold 1 gr., hicarb. soda 3 grs., water 8 oz.

Fixing Bath.—Sodium hypo. 4 oz., water 1 pint, liq. ammon. 30 drops.

Reducer for Deep Prints.—Cyan. potass. 5 grs., liq. ammon. 5 drops. water 1 pint.

Sensitizing Bath for Carbon Tissue.—Bichromate potash 1½ oz., water 30 oz., ammonia 1 dr., methylated spirit 4 oz.

Enamel Collodion.—Tough pyroxyline 120 grs., methylated alcohol 10 oz., ether 10 oz., castor oil 20 drops.

Mountant.—1. Fresh solution of best white gum. 2. Fresh starch.

Collotypic Substratum.—Soluble glass 3 parts, white of egg 7 parts, water 10 parts.

Collotypic Sensitive Coating.—Bichromate potash ½ oz., gelatine 2½ oz., water 22 oz.

Collotypic Etching Fluid.—Glycerine 150 parts, ammonia 50 parts, saltpetre 5 parts, water 25 parts.

Printing on Fabric.—Remove all dressing from fabric by boiling in water containing a little potash, dry, and albumenize with ammonium chloride 2 grammes, water 250 cubic cents., and the white of 2 eggs, all being well beaten together. A 70-grain silver bath is used, and the remaining operations are as for paper.

Cyanotype Printing.—Water 1 oz., red prussiate of potash (ferricyanide 1 dr., ammonio citrate of iron 1 dr. Prepare and preserve in the dark. Float the paper and dry. Fixation by mere soaking in water.

Various.

Luckardt's Retouching Varnish.—Alcohol 300 parts, sandarac 50 parts. camphor 5 parts, castor oil 10 parts, Venice turpentine 5 parts.

Matt Varnish.—Sandarac 18 parts, mastic 4 parts, ether 200 parts, benzole 80 to 100 parts.

Encaustic Paste.—Best white wax, in shreds, 1 oz., turpentine 5 oz. dissolve in gentle heat, and apply cold with piece of flannel.

Ferrotypes.

Collodion.—Ammonium iodide 35 grains, cadmium iodide 25 grains cadmium bromide 20 grains, pyroxyline 70 grains, alcohol 5 oz., ether 5 oz.

Bath. Silver nitrate 1 oz., water 10 oz., nitric acid 1 drop.

Developer.—Ferrous sulphate 1 oz., glac. acetic acid 1 oz., water 16 oz.

Fixing and Varnish.—Same as wet collodion process.

THE PHOTOGRAPHIC NEWS.

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CONTENTS.

IODIDE OF NITROGEN AS A PHOTOMETRIC AGENT.

SOME very interesting and valuable observations have recently been made by M. Guyard on the sensitiveness of iodide of nitrogen to light, and a translation of his recent communication to the *Annales de Chimie et de Physique* will be found in another column (p. 357).

M. Guyard's first observations as to the sensitiveness of iodide of nitrogen were brought about in a very curious way. He was watching what has long been believed to be the spontaneous decomposition of the iodide, the material being suspended in water contained in a glass vessel placed in a somewhat dark part of the laboratory, and, on lifting up the vessel to the level of the eye, he noticed an immediate formation of bubbles of nitrogen; but, on replacing the glass upon the table, the decomposition almost ceased. On now exposing the beaker to a bright ray of light which penetrated into another part of the laboratory, he at once perceived such an increase in the rate of decomposition as to convince him that light was the active agent.

Iodide of nitrogen is one of the most remarkable bodies with which the chemist is familiar, as it belongs to that small class of binary compounds which decompose into their elementary constituents with explosive violence when subjected to slight disturbing influences. When finely powdered iodine is stirred into ordinary liquid ammonia (say, 60 or 70 grains of iodine in an ounce or so of the liquid), a portion only of the iodine dissolves, and the remainder of the iodine is, in the course of five or ten minutes, converted more or less completely into iodide of nitrogen, this new body forming a black powder which may be separated by collection on a filter. When dry, the black powder is so prone to decomposition that a touch with a feather, or the shock caused by allowing it to fall from a height of a couple of feet upon the surface of water, will cause it to detonate. For this reason, only small quantities should be prepared at a time, and if it is intended to dry the substance, it should be separated out into small batches of a few grains, each of these being placed upon a separate piece of blotting-paper.

Chemically, iodide of nitrogen may be regarded as ammonia in which the whole of the hydrogen is replaced by an equivalent proportion of iodine; the formula of ammonia being NH_3, and that of iodide of nitrogen being NI_3. When, however, it is prepared by the comparatively crude process above indicated, it not unfrequently happens that the replacement of the hydrogen of the ammonia is incomplete, the compound NHI_2 being formed; but as regards general character this is very similar to the true iodide. Indeed, it appears to be convertible into the true iodide by mere washing with water; a splitting up into the true iodide and ammonia taking place in accordance with the following reaction:—

$$3NHI_2 = NH_3 + 2NI_3$$

In order to prepare the iodide of nitrogen in a pure state, a cold saturated solution of iodine in absolute alcohol is mixed with twice its bulk of ordinary liquid ammonia, and the black precipitate which is thrown down is well washed with water.

The experiments of M. Guyard are of especial interest, as opening up a method by which we may hope some day to arrive at an accurate determination of the dynamic equivalent of light; but before venturing to speak confidently regarding this matter, we should like to have a more satisfactory proof than M. Guyard gives, that radiant heat takes no part in the decomposition of the iodide of nitrogen. In fact, we cannot regard M. Guyard's experiment, on which he bases his assumption that heat is not concerned in the re-action, as possessing any value whatever, as it is merely based on an observation that the decomposition under the action of light can take place rapidly without sensible rise of temperature. Now, the fact of the matter is, that this experiment, if it indicates anything whatever, tends to prove just the contrary, as, if the radiant heat decomposes the iodide, it naturally ceases to exist as heat, and takes mainly the form of potential energy which has been exerted in lifting the atmosphere by the elastic force of the gaseous nitrogen liberated, or, what amounts to nearly the same thing, the heat is, to use an old-fashioned expression, rendered latent in converting solid nitrogen into the gaseous state. In addition to this, the kinetic relations of iodine and nitrogen towards each other must be taken into account. Certainly, from a physical point of view, one would consider the possibility of the decomposition taking place without a rise of temperature rather an evidence that heat is an essential factor in this re-action, than that it takes no share.

M. Guyard's contention also appears untenable from another point of view, as the researches of Captain Abney and others conclusively prove heat and light to be absolutely inter-continuous, and no line of demarkation can be drawn between them. The practical distinction is not alike for all, as the extent to which the visible spectrum extends towards the least refrangible end cannot be measured, but must be expressed by a personal constant for each observer.

It is interesting and curious to find that when the decomposition of the iodide of nitrogen has reached a certain point, sudden decomposition or explosion takes place, this decomposition being preceded by a rise of temperature.

We cannot for a moment accept the kinetic equation by which M. Guyard represents the physical aspect of the decomposition (page 357), as many collateral circumstances are not considered at all; but one must not expect too

much, as at the present time chemistry does not possess a notation by which dynamic changes can be represented in the same exact fashion that the gravimetric interchanges of elements can be set forth.

Guyard finds that the maximum of decomposing action on the iodide is possessed by the yellow rays; but his experiments are not so exact as to justify us in concluding more than that the less refrangible rays tend to be more active in the case of the iodide than the more highly refrangible rays.

In conclusion, we may remark that the whole question of the action of light on the iodide of nitrogen affords a most promising field for work to those who have leisure and inclination to labour towards the elucidation of the fundamental doctrines of actinic action.

ON THE RAPID DRYING OF GELATINE NEGATIVES.

WHEN first the use of gelatine plates became general, the difference between them and collodion plates in the matter of the time taken for drying after fixing, &c., was found to be a considerable inconvenience, and one of a somewhat irritating nature.

The photographer had been accustomed, when using a wet plate, to have it, if he so desired, dry, varnished, and in the printing frame within a few minutes of the time when it was developed. The difference was very great when we came to use gelatine plates, and found instructions given that artificial heat was on no account to be used in drying the negatives, and this the more so as a gelatine film dries without heat much more slowly than does a collodion one even under the same conditions.

There have been from time to time introduced methods of assisting the process of drying, and although one or other of these is probably known to every photographer, a resumé of those which have come under our observation, with a few remarks on each, may not be out of place.

The one which will probably occur first to the mind of each of our readers is that in which alcohol is flowed over the plate. This is a simple method, and, if there be no very great haste, probably the best and most practical of any. A word or two concerning it may therefore possibly be useful. It is evident, from remarks that we have heard, that the function of the alcohol (generally not pure alcohol, but methylated spirit) is not by all correctly understood. It is supposed that the alcohol has some mysterious power of absorbing the water in the film. This is, it need scarcely be said, a mistake. What happens when a quantity of alcohol is flowed over a plate is as follows. On account of the "affinity" which water and alcohol have for each other, the two, when brought together, incline to mix in such a manner that any small proportion of the mixture will contain the same relative quantities of alcohol and water as any other. As a consequence, it comes about that some of the alcohol over the films penetrates the latter, whilst some of the water in the film is withdrawn to mix with the flowing alcohol. This is one effect, and it will be seen that were this all, there would remain in the film a more easily evaporated liquid than there was before, and that therefore the film would be more readily dried. There is another action, however: the mixture of alcohol and water has a certain physical effect on the gelatine film. It tends to harden it, and to cause it to shrink up, so that it squeezes out some of the fluid, much as sponge does when compressed.

When the flowing process is repeated, the action is similar, but more powerful, as the mixture of alcohol and water contains a larger proportion of the former liquid than before. When the process is repeated several times, the result is, that the film contains in it only alcohol, practically as strong as that which was poured over it, and that the thickness of the film is materially decreased. There is, therefore, now nothing requiring drying ou except a small quantity of alcohol, and this will, of course, evaporate very much more quickly than would the water which was originally in the film. Still, some little time is necessary in ordinary circumstances, perhaps from a quarter of an hour to half-an-hour. This is if no artificial heat is used, but the objection to artificial heat, which holds when there is water in the films, does not hold to the same extent when there is alcohol. Indeed, if we use absolute alcohol, and flow so frequently that the water in the films is entirely extracted, we may use artificial heat as freely as with a wet plate, because gelatine is quite insoluble in absolute alcohol. Even when ordinary methylated spirit is used, and there are only two or three flowings given to a plate, we may carefully warm it afterwards.

We may here say that when a number of negatives are to be dried with alcohol, the best course to pursue is to use a flat dish, into which there is poured enough of this liquid to completely cover a plate. The plates are left in this dish for a few minutes. The first of these are immediately placed on one side to dry. After three or four have been dried thus, and some appreciable quantity of water has been so added to the spirit, it is advisable to flow each plate, after removal from the bath, with a little fresh spirit.

A method of still further increasing the rapidity of drying was first communicated to our columns by a correspondent now about three years ago. It consists in flowing the plate with ether (which may be methylated) after the operation with spirit has been completed. The ether and alcohol diffuse into each other, so that a liquid even more readily evaporable than alcohol is left in the film. A negative flowed first with alcohol, then with ether, will dry by being placed in a cool draught of air for, perhaps, a couple of minutes. Heat may, however, in this case, be used in moderation without danger.

We must on no account pass over a method of rapid drying which was shown to us by an assistant in a photographic portrait establishment some little time ago.

"How do you dry your negatives?" asked our friend.

"Let them dry of their own accord if there be no hurry. If there be, use methylated spirit"

"Ah, but there is a much better way than that; don't you know it?"

We mentioned ether.

"No, better still; we dry our negatives with a towel."

We naturally thought this was a joke, and asked for a demonstration. Our request was at once granted. A negative from the washing vessel was taken, and was flowed with methylated spirit several times, and immediately afterwards, to our no small astonishment, a towel was taken, and the film was rubbed with this (apparently in no very tender manner) till it was quite dry.

We looked at it expecting to see at least marks and scratches, but there were none such.

We will not venture to say that any brand of plates could be so treated, nor can we be sure that some particular skill or knack, not noticeable to the casual observer, may not be a necessity on the part of the manipulator. We have ourselves never summoned up courage to make the attempt with one of our own negatives.

Whilst on the subject of the drying of negatives, we must not forget to mention the considerable effect which alum has on a film in squeezing the water out of it, and thus making it dry more readily. After a film has been thoroughly treated with alum, a little artificial heat may be applied in drying, even if no alcohol be used. It must be very little, however, because although a film treated with alum becomes, after it has once dried, insoluble in even boiling water, it is by no means so before it has dried. It is quite possible to dissolve gelatine in a warm saturated solution of alum.

If chrome alum (a saturated solution) be used instead of common alum, the effect is much more marked.

THE *SALON* PICTURE SAID TO BE COPIED FROM A PHOTOGRAPH.

In reference to the affair of M. Dantan, alluded to by M. Leon Vidal in our last issue, Mr. A. Davanne writes to the *Siècle* as follows:—"In the present case, the photograph, an original work, is a complete composition, and not a reproduction; yet this initial composition will not have, according to the future law, any of the rights accorded to artistic property; whilst the copy, executed by M. D——— or any other person, confers upon its author rights which are refused to the original production. You will doubtless be struck, Mr. Editor, with this strange anomaly, thanks to which an application of colours, used with more or less art, transforms a composition already existing, and tranfers the legal artistic property to a person who has not originally conceived it." After much newspaper correspondence and discussion in relation to M. Havard's criticism of Dantan's picture, this latter gentleman at last freely acknowledged that he made use of a photograph in the composition of a photograph. No one can reasonably regard this use of the pencil of light as a fault, for why should not artists take advantage of every facility afforded them by science? Still, M. Dantan must be blamed for not freely and at once acknowledging the aid he received from the camera. M. Dantan lays great stress on the fact that he can prove that he worked on the picture for two months, and he further adds: "Loyalty compels me to acknowledge that I have had in my hands a photograph representing the same subject as my picture, and that this document was used by me for the arranging and the composition of my painting, *L'Atelier de Moulage*."

In reply to this, Mr. Havard, who origiually called attention to the matter in the pages of the *Siècle*, writes:—"We never assumed that the author of *L'Atelier de Moulage* did not work at his picture, but we simply insisted that the photograph played an excessive part iu the composition of this remarkable painting. This M. Dantan confesses in part, and may his loyal acknowledgment of the fact serves as a warning to other artists who may be tempted to borrow too freely."

THE SPECTROSCOPE AND ITS RELATION TO PHOTOGRAPHY.

BY C. RAY WOODS.

IX.—Fluorescence and Phosphorescence.

These two analogous, if not identical, phenomena demand our attention, inasmuch as one of them, at least, is familiar to the photographer, by reason of the important part it plays in the measurement of the brilliancy of light, and more particularly in the determination of the rapidity of gelatine plates.

Fluorescence was first investigated by Stokes, about thirty years ago, he having proposed the name on account of this peculiar property being possessed by fluor spar (fluoride of calcium), iu connection with which it was first noticed in a high degree. Fluoride of calcium is met with in nature of various colours, green being one of the most common; but, if placed in a light rich in ultra-violet rays, it glows in a manner more readily noticed than described. A solution of quinine, which is itself colourless, fluoresces with a bright blue colour; cosine dye, in itself of a crimson red, fluoresces with a bright green colour. Canary glass, which is coloured with uranium, derives its value for ornamental purposes from its fluorescent nature.

If we place a piece of white paper or cardboard coated with a solution of quinine in the spectrum, it will be noticed that the rays beyond the violet become visible, appearing in colour a bright lavender blue. The same thing may be equally well shown by using common lubricating oil, as recently pointed out by Captain Abney. Eye-pieces containing a fluorescent substance have been made for the spectroscope to facilitate observation in the ultra-violet portion of the spectrum. They are not extensively used, however, inasmuch as photography furnishes the readiest means of investigating the more refrangible portion of the spectrum.

Phosphorescence is most familiar to as in connection with luminous paint and the luminous tablets used with our sensitometers. Here we have an absorption of light by exposure to some brilliant source of illumination, and a subsequent and comparatively slow emission of it. Becquerel, who has made this subject a study, found that nearly all bodies are phosphorescent; but, in most cases, the phosphorescence is so small, and the light is emitted so soon after exposure, that it requires a special piece of apparatus (which he devised) to show it. As in the case of fluorescence, phosphorescence is caused by absorption of the *ultra-violet rays*, and the emission of rays of lower refrangibility.

That substances should absorb light, and be capable of storing it up for some little time, so that it may be afterwards utilized, is a phenomenon which is apt to cause some surprise, and at first sight appears difficult of explanation. Phosphorescence, however, is strictly analogous to another phenomenon that everyone meets with in his every-day experience, and which, moreover, he usually thoroughly understands—namely, the conversion of light into heat. When light falls upon a body capable of absorbing it, the temperature of that body is raised, and it radiates heat, or sends out *dark rays* to other bodies surrounding it. We have an indirect conversion of rays of high refrangibility into rays of lower refrangibility. So with phosphoresence: rays of very high refrangibility and short wave-leugths, the invisible rays beyond the violet, are absorbed, and rays of lower refrangibility, but still of sufficiently short wave-lengths to excite the retina, are emitted. Considering the resemblance of phosphorescence to the conversion of light into heat, it is little wonder, therefore, that the phenomenon is almost universal.

Among the substances that most readily exhibit phosphorescence are the sulphides of the alkaline earths, the sulphide of calcium being that which is used for making lumiuous tablets for photographers. If a tablet has been kept for a long time in the dark, so that it has lost all its luminosity, and be then exposed to the spectrum, it will be found that luminosity is excited strongly where the ultra-violet rays have fallen, the luminosity decreases where the violet rays have fallen, and stops short in the dark blue or indigo near G. If the tablet be rendered luminous, and then examined by means of the spectroscope, it will be found that the light it emits is mainly confined to a small portion of the spectrum just below G. A small amount of yellow-green, yellow, and red, is also emitted, but it is too weak to impress itself upon a sensitive plate.

For all photographic purposes, the light from the tablet may be practically regarded as monochromatic, and its position in the spectrum almost coincides with that which produces the maximum effect upon bromide of silver. Its value, therefore, in measuring the rapidity of a gelatino-bromide plate is considerable. When we take into consideration, however, other salts of silver, the maxima of which differ very much from that of the bromide, it is pretty plain that the sensitometer cauuot give us a comparative test of their various rapidities. It has been estimated by Captain Abney that if a wet plate be exposed beneath a sensitometer depending on a luminous tablet for its light, the number given would really represent only about one-fourth of its real rapidity. The number given on a chloride plate would represent only about one-third of the true value. When iodide is present in a plate, there must necessarily be some difference between the rapidity of such a plate, and one containing pure bromide only, giving the same number in the sensitometer; but the percentage of iodide that is put into an emulsion is usually so small that the slight difference may be dis-

regarded. In such a case, however, the plate containing the iodide has the advantage of whatever difference exists.

Actinometers depending on the action of light on a phosphorescent tablet have not the same great value that the sensitometer has. In this case, we have to consider what rays have the greatest effect upon a tablet. These are undoubtedly the ultra-violet rays, which do not have as much effect upon a gelatino-bromide plate as the dark-blue portion of the spectrum.

An important application of the phosphorescence of substances was made many years ago in the examination of the infra-red portion of the spectrum. It is well-known that the luminosity of the phosphorescent tablets is increased by the application of heat, but the luminosity lasts for a much shorter time. The application of a cold body, on the other hand, decreases the luminosity, but such luminosity extends over a longer period. Hence may be mentioned, by the way, the importance of allowing an interval of time to elapse between exciting the sensitometer tablet and exposing the plate, thus averaging the luminosity of the tablet which forms the standard light. The red and infra-red (or dark rays, as they are sometimes called) produce the same effect as the more direct application of heat. When a phosphorescent substance that has been rendered luminous is placed in the spectrum, the rays of low refrangibility cause it to become more luminous for a time, but, as the increase in luminosity is but temporary, the lower portion of the spectrum soon appears dark on a bright background.

As far back as 1866, Edmund Becquerel was thus able to show some of the solar lines in the infra-red. More recently, Henri Becquerel has been making further experiments in this direction.

This way of investigating the less refrangible portion of the spectrum is not so good as the photographic method, the lines not appearing as sharp, and the action not extending so low down in the spectrum. The results are evanescent, but by placing the phosphorescent surface in contact with a gelatine plate (as suggested a short time back in the Editorial Notes), a permanent record may be obtained.

By-the-Bye.

THE CAMERA AND THE TRICYCLE.

THE old-fashioned wooden velocipede, with its loud rattle over the stones, its ungainly-looking cranks, and creaking connecting rods, is now a thing of the past. How completely it has been crowded out in the struggle for existence by the spider-like and rubber-shod steel tricycle of the present day!

Who cares much about the history of the velocipede? Still, as photographers, we should remember the share that Nicéphore Niepce and his brother Claude had in the invention. Claude first came to England in order to push his Pyreolophore, an ingenious velocipede in which both hands and feet were used in driving; and while Claude was in this country he died; but Nicéphore, being busy with his photographic researches, altogether neglected the invention.

Respecting the two-wheeled velocipede or bicycle as a vehicle for an outing with the camera, need we say more than that it may answer in the case of a few adventuresome spirits who do not mind risking their own limbs and their own apparatus; but the main point for our readers now to consider is how far labour can be saved by taking out one's photographic kit on the far more comfortable three-wheeler or tricycle, and in this matter, as in many others, there is no alternative but to rely upon the experience of others. "But surely it is easy to borrow a tricycle and gain experience for oneself?" may be said. There are, however, more difficulties than one; indeed, in the first place, it is by no means easy to borrow a tricycle—at any rate, such a one as can give a just idea of the labour involved in 'cycling; and even if a first-rate tricycle were borrowed, several weeks' practice would be necessary before the full advantages of 'cycling as a means of locomotion could be thoroughly brought home to the rider. One who has a first-rate tricycle would be considered indiscreet if he were to lend it, even to an experienced rider; but very, very few would be rash enough to place such a machine in the hands of a learner; indeed, it is almost considered an axiom among tricyclists, "Never lend your machine to a friend unless you wish to make an enemy of him." Still, it may be urged, there are many persons who let machines out on hire, and what can be easier than to have one of these for a few weeks? In actual practice, however, difficulties will arise here, as it will be found that, although the dealer may be quite ready to lend out his best machines to experienced riders, the non-rider can get nothing but such a machine as is likely to make him forswear tricycling for ever; and if the patched-up wreck should give way at any point, he will, perhaps, be called upon to pay more than its value for repairs.

As before stated, several weeks' practice is required in order to enable one to judge of the real advantages of tricycle-riding over walking; and not only must one find the best position for the seat, and the most suitable height for the handles, but a more important point still: there are certain muscles which must be broken in to the work, muscles which are scarcely exercised in walking. Hence it is that the first half-hour's ride on a tricycle often serves to tire you out, and effectually prevent further trials.

For the above reasons, it is well to so far trust to the experiences of others as to boldly spend the £20 or so which a first-rate tricycle will cost, instead of tampering with half measures, as the latter are almost of necessity misleading.

A second-hand machine is not, as a rule, a very satisfactory purchase; but if you are not only a mechanic, but have also studied the details of tricycle construction, you may often obtain a really good second-hand machine at a little more than half the price of a new one; but one always runs some risk.

Although there are nearly four hundred kinds of tricycle in the market, we may class these under the heads of the front-steerer, the back-steerer (hayfork or bicycle action), and the "Rudge" or "Coventry" tricycle; in the latter, a large driving wheel is at the left-hand side of the rider, and two smaller wheels are at his right, both of these being simultaneously acted on by the tiller. We are inclined to put the front-steerer out of the competition, and to only consider the back-steerer or the hayfork type and the "Coventry." In the case of the former, the leather case containing the apparatus should be suspended beneath the fork of the backbone by straps passing fairly underneath the package, and the stand (a folding one) should be firmly attached to the top of the backbone, the end, perhaps, projecting, tail fashion, over the rear wheel, this arrangement being made to so place the load as to tend to neutralize the main disadvantage of the back-steerer. Instead of a stand, the Lancaster clip (p. 344) may be used. Should the "Coventry" form be adopted, the case containing the luggage is best supported on a light frame fixed immediately behind the seat, while the long bar on the right-hand side takes the tripod. Indeed, our first photographic experiences with a tricycle were gained on a "Coventry," not, indeed, as the machine is now made, but in its original form, with long foot levers and connecting rods instead of the gear wheel and chain now used. With this machine we found no difficulty, easily taking out a whole-plate kit for wet collodion work to a distance of twenty miles; but on our present machine, a modern one of the same type, we could do much more than this without over-fatigue.

One word about the relation between speed and power

When the road is level and the load light, the gearing of the machine may be such that a complete revolution of the treadle crank shall propel the machine as much as 15ft., but with a machine so geared it is impracticable to do hill work or to take much of a load, consequently it is far better to select a slower gearing; let us suppose one which gives us a progression of a little over ten feet for each revolution of the treadle shaft, this corresponding to what is technically known as a "40-inch" gearing. An efficient brake is of great importance, and great care must be taken not to let the loaded tricycle get the better of the rider in running down hill.

What kind of ground can be covered, and how much luggage may be taken, is a natural question? It should suffice to say that the Furca Pass has been "doue," and that the carrier tricycle used by the proprietors of the *Evening Standard*, in London, and *Le Matin*, in Paris, takes loads of as much as a hundred pounds, and makes as good speed as the average Hanson cab. Mr. John Browning, writing in the last YEAR-BOOK, speaks of a load of sixty to eighty pounds and a twenty mile ride. Indeed, the tricycle has now a commercial importance which does not seem at all likely to diminish, but rather promises to increase.

Readers who may wish to study out the subject of 'cycling as adapted to the wants of the photographer, may find severl articles in our back volumes, and also in the YEAR-BOOKS, and our advice to those in doubt as to whether to adopt the tricycle, is emphatically, "do so, by all means."

A CHEMICAL PHOTOMETER OR RADIOMETER BASED UPON THE DECOMPOSITION OF IODIDE OF NITROGEN.

BY M. ANTHONY GUYARD.*

IODIDE of nitrogen which is moist, or better still, suspended in pure water, decomposes with effervescence when exposed to diffused light or other luminous radiations, and the decomposition of this body by light is a phenomenon of such exquisite sensitiveness that the iodide of nitrogen constitutes a true chemical radiometer; but there is this difference: in cases when the radiometer of Crookes remains unmoved, the iodide of nitrogen is decomposed with a notable degree of activity.

Let us, for example, allow some iodide of nitrogen to lie at the bottom of a vessel full of water, and it will be found that it remains unchanged as long as it is kept in absolute obscurity; but one can scarcely expose it to a dull diffused light without finding that bubbles of gas are evolved; and in full daylight the number of the air-bubbles increases, and these are formed with a certain rapidity and much regularity.

Even in diffused light it is easy to perceive that the decomposition is determined by the surrounding light. If the sun shines, the decomposition becomes rapid; but should a cloud pass, it diminishes immediately, while a further diminution in the evolution of gas takes place if the sky becomes generally overcast.

Supposing that a bundle of luminous rays is allowed to impinge upon the iodide, the decomposition takes place with considerable energy, and the effervescence is as distinct as that which takes place when sulphuric acid acts upon chalk, the effervescence lasting as long as the action of light is maintained, and ceasing immediately the iodide is brought into darkness. Those portions of the iodide of nitrogen which remain round about the portion illuminated by the intense pencil of rays only evolve a few bubbles, as the iodide appears to be a bad conductor of the molecular disturbance which is produced locally by the direct action of the pencil of rays.

Nothing can be more strikingly beautiful than this experiment, in which the bundle of rays, whatever its form, is converted into a collection of bubbles having the same configuration. Immediately the luminous rays are shut off the active effervescence ceases, but to continue in a modified intensity proportional to that of the surrounding diffused light, or to totally stop, if the iodide is placed in absolute darkness. Once more, the active decomposition may be called into existence by exposure to the full intensity of the luminous pencil, and so on as long as any iodide remains undecomposed.

The decomposition of the iodide of nitrogen is powerfully affected by the various coloured radiations, but under the action of violet rays, as obtained by transmitting light through a solution of permanganate of potassium, it diminishes; but under the influence of the blue rays (sulphate of copper) it augments slightly. Orange-red rays, obtained by transmission through a solution of bichromate of potassium, have approximately the same effect as white light, while yellow rays produce a maximum of decomposition far exceeding that due to white light.

The use of the iodide of nitrogen photometer should, one might expect, be very easy, and it may perhaps render it practicable to determine the chemical and mechanical equivalents of light.

One may, for the present, define the chemical equivalent of light as the quantity necessary to decompose one equivalent of ammonia with the liberation of one equivalent of nitrogen; and the mechanical equivalent of light, as the elastic force, or the work produced by the passage of the equivalent of nitrogen into the gaseous state. It is probable that in an actual experiment the light is transformed into heat, and then accompanies the gas. It remains to be proved that it requires exactly as much light to cause a decomposition as to determine a combination—or, in other words, it will require as much light in the iodide of nitrogen radiometer to cause the separation of the constituents of one equivalent of ammonia as to determine the combination of their equivalent of chlorine, and of hydrogen in the photometer of Bunsen and Roscoe. By representing by ϕ the chemical equivalent of the decomposition of the light, and by ϕ' the chemical equivalent of combination of light, we can arrive at the following dynamic equation:—

$$\underbrace{\phi + NH_3 - I_3}_{\text{Decomposition}} = \underbrace{\phi' + Cl_3 + H_3}_{\text{Combination}}$$

The estimation of the force occasioning combination as exemplified by the photometer of Bunsen and Roscoe, in which the maximum of action situated in the violet, and of its decomposing action, as exerted upon iodide of nitrogen, with a maximum in the yellow, should be of great interest, and opens up new fields for the optician.

It must be called to mind that the maximum of decomposition has already been proved to be in the yellow, as the result of the excellent researches of Caillelet, Cloëz, and Gratiolet on the decomposition of carbonic anhydride and chlorophyl in the leaves of plants. Still these observations, bearing upon highly complex phenomena, cannot render photo-chemistry the same kind of service as may be expected to result in the case of bodies so well known as ammonia, iodine, and water. All these can be readily obtained of an identical degree of purity, and the reactions, which can be carried out in apparatus of the simplest construction, are well under control. The reaction of light on iodide of nitrogen is calculated to give to chemistry, physics, physiology, and industry much valuable information.

The reaction of iodide of nitrogen is to light what the voltameter is to electricity, and it may be called the *chemical radiometer*. The equivalent of iodine or that of nitrogen may be destined to become the unit by which sources of light are to be measured, whether the light be that by the humble night-lamp, or that of the orb of day.

The decomposition of iodide of nitrogen under the influence of light is so strongly defined that the eye can dis-

* A communication to the *Annales de Chemie et de Physique.*

tinguish the least variation, so that the iodide of nitrogen will become the most valuable quantitative reagent used in optics; indeed, with a few centigrammes of iodide of nitrogen one may obtain six or seven cubic centimetres of nitrogen in fifteen or twenty minutes, under the action of the yellow rays.

An important point is the circumstance that the physical conditions which may contribute to the decomposition of the iodide of silver are at least as simple as the chemical conditions which obtain; indeed, one cannot well attribute the effect to calorific radiations accompanying the light, as the luminous rays alone influence the decomposition of the iodide of nitrogen.

This may be proved readily enough by placing a small iodide of nitrogen apparatus in a vessel of glass, through which a current of water at a constant temperature circulates rapidly, and a small thermometer placed in contact with the iodide of nitrogen shows no variation, however intense the light which causes the decomposition may be.

When iodide of nitrogen is suspended in water and decomposed under the influence of light, a period arrives (perhaps corresponding with some determinate constitution of the substance) when a violent explosion takes place, which serves to break the glass vessel into thousands of fragments, and what is remarkable is that such explosions are far more violent than when the iodide is exploded by other means.

When vessels of thick glass are used, a period is arrived at when partial explosions take place at intervals of five or six minutes; but generally a total explosion ultimately occurs, the glass vessel being then broken.

In a vessel of thin glass, on the contrary, there are rarely more than one or two partial explosions, the explosions being generally total. In many cases, a sudden elevation of temperature has been observed to precede the explosion, and this elevation has often served as a useful warning.

The author will continue his experiments.

A VISIT TO THE "STANDARD OF WHITE LIGHT."

BY YOUR STROLLER.

BEING in Paris a short time ago whilst the Electrical Congress was sitting, I happened to stumble against one of the English delegates, who seemed full of the new standard of white light, of which, up to that time, I had learnt nothing. Being of a turn of mind which naturally resents anything like an acknowledgment of ignorance, "I knew all about it, you know," and by degrees managed to pick up from answers to casual, but, at the same time, rather leading questions, that the new standard of white light was the light given out by melting platinum, and that there was to be an exhibition of this interesting curiosity. I was dragged by the arm by my friend across the river, and whilst he energetically explained the peculiarity of this new standard—sometimes, it must be confessed, in rather a depreciative manner—eventually we found ourselves in the *Rue d'Ulm*, and outside the *Ecôle Normale Superieur*. A ring at the bell, and an explanation in execrable French by *mon ami*, caused us to traverse a narrow open passage, and to enter into *la troisieme porte à droite*, as the *concierge* told us. Here we were ushered into Monsieur Débray's laboratory, the man, of all others, who is fitted to deal with that most refractory metal, platinum, since it is here where his classical experiments on its purification and properties have been carried on. "*Descendez, Messieurs, je vous prie*," says M. Débray, after our introduction to that famous chemist, and we did descend to the cellars below; and here, in a vault painted pitch black, which might have been well left to ghouls and other such-like folk, we saw the standard of white light. Monsieur Violle, the energetic proposer and carrier out of this standard, greeted us cordially, and took us round from the deep gloom to a hissing and spluttering crucible, in which was some glowing liquid of some kind being *warmed* by an enormous jet of oxygen and hydrogen, which played on and round the surface of this liquid. A square opening in the cover of the crucible, we were informed, was a square centimetre, and the glowing liquid was melted platinum. The surface was not uniformly bright, but ever and anon little particles and scum of something or another would cloud it. "Not very satisfactory," said I, to my friend; "not uniform enough." Wait a minute, however. "Now," said M. Violle, "look at it at the moment it solidifies." And we did. The blow-pipe was stopped and in five or six seconds the surface of the liquid assumed a perfect uniformity. The platinum had begun to solidify. I nudged my friend, who did not, somehow or another, seem half pleased. There, then, was the new standard—*molten platinum at the moment of solidification*. Above the orifice of the crucible was a mirror, at an angle of forty-five degrees, reflecting the light emitted on to a photometer, with which the comparisons were made, the other source of light being a Carcel lamp of the ordinary moderator type. "How much platinum have you in the crucible?" I asked of Monsieur, who was conducting the melting operations. "About 30 kilogrammes," he replied.

I should like to have turned that 30 kilos into money, though I did not say so. I ventured to remark that the oxygen used must be pretty considerable, and so it was, for we again descended, and came upon what would ordinarily be considered a fair sized gasometer for ordinary house gas, and in it, we were told, was stored oxygen under a pressure of some atmospheres. Orchard, of Knightsbridge, would have made a fortune by selling it by the foot, but they don't seem to think much of that lot in Paris. They measure it by the ton, I should fancy.

This cellar is not unknown to other scenes of science, for here it was that Mascart made his celebrated experiments in spectroscopy, and determined wave lengths, and what not, in a manner which those who understand these kind of things say will remain as a record for all time. "I lived down here for some months," said Monsieur Mascart, who was present. I can't say I envied him. The Bastille was a joke to this, I should say, and yet Monsieur did not have that loathing for the place which I should have had under ordinary circumstances.

But the standard of white light is my subject, and I must confess that if the standard has to be used with such apparatus as I saw, and with such precautions, I should guess that Paris will have the unique honour of being the permanent home of the standard. Fancy 30 kilos of pure platinum, and crucibles that are incapable of giving up impurity to the metal. Fancy, too, the chlorate of potash and manganese that must be used to prepare the enormous quantity of oxygen required; and then fancy the anxiety of catching the light from the molten metal at the moment of solidification; and then you have further to fancy that when the Carcel lamp has been standardized, the quality of oil and of wick may vitiate days of experiments. As a practical unit this fails entirely, and I should say that it will be long before it is adopted in any way except theoretically. As regards photographic purposes, it is useless. But I have not told what is the standard. Here it is in French:—

"L'unité de lumière simple est la quantité de lumière de même espèce emise en direction normale par un centimetre carré de surface de platine fondu à la temperature de solidification. L'unité practique de lumière blanche est la quantité totale de lumière emise par la même source."

In English it is thus:—"The unit of simple (monochromatic) light is the quantity of light of the same kind emitted in the normal direction by a square centimetre of melted platinum at the temperature of solidification. The practical unit of white light is the total quantity of light emitted by the same source."

Well, it may be *practical*, but it is not *practicable*. What we photographers want is something more simple. This, perhaps, may be given us at the promised Photographic Congress at Brussels.

CARBON PRINTING.

Lesson IV.

Making Transparencies for Enlargements.

For transparencies a special tissue is made, the colouring matter being indian ink in an extremely fine state of division, the quantity of pigment used being more than double that present in ordinary tissues. The sensitising, drying, and printing of transparency tissue is the same as for the ordinary, except that the exposure to light is from twice to thrice as long.

The development of transparencies is effected upon glass plates covered with a thin film of gelatine composed of—

Gelatine	1 ounce
Bichromate potash	30 grains

Dissolve by the aid of heat; then—

Water	20 ounces

Filter before use.

The plates may either be polished, and then coated, or they may be cleaned in acid and water, and then, after a thorough rinsing, be coated with the gelatine solution whilst wet.

When coated with gelatine, place the plates upon a rack to dry, and when dry, put them into sun or daylight so as to render the gelatinous coating insoluble, for which purpose the bichromate is used. When the exposed tissue (which should have an opaque safe edge of at least half-an-inch all round the opening in mask) is taken from the frame, turn up the edges about an eighth of an inch all round so as to form a shallow tray, and pin upon a light board; then coat with plain collodion, and when set, hang up to dry in the dark-room; then, with a pair of scissors, trim off the turned-up edges and immerse in cold water. As soon as sufficient water has been absorbed, insert a prepared plate underneath (the plate being a little larger than the piece of tissue), and place the tissue in position upon it; then lift from the water and proceed to squeegee.

Develop the image in water at 120° F., and when development is complete rinse in cold water and place away to dry.

If a transparency is to be made from a negative that is flat and weak, instead of developing upon a gelatinized plate, polish a plate and coat with plain collodion, next immerse in cold water until greasiness disappears, then (omitting the coat of collodion) immerse the tissue in cold water, and, before squeegeeing, cover the plate and tissue with Mackintosh cloth, so as to avoid disturbing the collodion between the edges of the tissue and glass plate. Develop as usual, and, when dry, intensify with a strong solution of permanganate of potash, when the transparency will, instead of being weak and flat like the original, be strong and vigorous, and capable of yielding an enlargement much superior to the original negative.

In making transparencies for enlargements, care must be taken that all detail in the light lights is present, else the result cannot be satisfactory.

From the transparency an enlarged negative is made in the camera, either by the wet process or upon a gelatine plate, the film of transparency being towards the lens; the negative, when dry, is retouched, and edged with black varnish, all round, for a safe edge. A print is then made upon carbon tissue, and when the exposure is completed, a piece of *single* transfer paper, a little larger than the tissue, is cut from the band, the two are immersed in cold water, examined for air-bubbles, and, when the tissue has absorbed sufficient water, they are removed, with the faces in contact, laid upon a smooth bench (tissue being uppermost), and the squeegee applied to the back.

Development is effected by immersion in hot water, which will soon loosen the backing paper, which is stripped off; gently laving with hot water will complete the development, when the print is transferred to cold water, and from thence to a strong solution of alum, which will remove any traces of bichromate that may linger in the paper. After remaining in the alum for ten or fifteen minutes, again place in cold water, and give three or four changes, after which the print is hung up to dry, when the print is ready for mounting, and requires no second transfer, having been made from a reversed negative—this being the single transfer process of carbon printing.

Notes.

A Photographic Society has been formed in Derby, and Mr. Fred W. Simpson has taken the office of Honorary Secretary.

A fire, which broke out in Swan's Electric Light Works at Lille, on Friday last, did much damage to property, and four persons were injured.

That yellow light should exercise an actinic effect greater than that of white light, is not quite what one might expect from every-day experience with silver salts; yet M. Guyard says that iodide of nitrogen is decomposed more rapidly when exposed to yellow radiation than to white light.

An instance of a photograph of a natural history specimen being preferred to the actual thing is interesting; but we find that, at a recent meeting of the Massachusett's Institute of Technology, Mr. Praz preferred to exhibit a photograph of a remarkable cotton stalk in a fresh state rather than the dried specimen itself.

In the course of his interesting paper on the cotton plant, he called attention to the value of photo-micrography as a means of building up such a history as may be expected to ultimately lead to solid information in relation to cotton culture.

A microscopic examination at once reveals the quality of the cotton, as the better it is, the more perfect its spirality, and the more regular, sharp, and positive are the oily deposits. But to merely observe is a very different thing from obtaining permanent records, as these must ultimately throw light on the influence of meteorological and other conditions. India and the United States might do well to exchange series of such photographs.

A correspondent writes:—"Having a large stock of glasses which had become so stained and corroded as to be apparently valueless, I tried Mr. Plener's plan of using hydrofluoric acid. Six ounces of the commercial acid and a quart of water were mixed together in a gutta-percha dish, and each plate was immersed for about ten seconds, when it was rinsed with water. Nothing could have been more satisfactory."

In dealing with hydrofluoric acid some precautions are necessary, as it must not be allowed to come in contact with the skin, and it should not he used in the same apartment where there are lenses or other optical instruments. A trace of *the vapour* takes the polish off glass very rapidly.

The legal statement of the case in the action brought by Mr. Sarony, of New York, against a Lithographic Company for an infringement of copyright in a photograph of Mr. Oscar Wilde, and referred to in the NEWS some time ago, is funny reading. The document, with much circumstantiality, sets forth that the photograph in question "is a useful, new, harmonious, characteristic, and graceful picture, and that said plaintiff made the same at his place of business in said city of New York, and within the United States, entirely from his own original mental conception, to which he gave visible form by posing the said Oscar Wilde in front of the camera, selecting and arranging the costume, draperies, and other various accessories in said photograph, arranging the subject so as to present graceful outlines, arranging and disposing the light and shade, suggesting and evoking the desired expression, and much more to the same effect. If all this is necessary to explain what sitting for one's portrait is, one would rather take a photograph than describe it.

Are the best phototypic blocks which can be made by such processes as those of Ives or Meisenbach equal as works of art to the best wood engravings? This is a question very often asked, and, like many other questions, it cannot be answered by a simple yes or a direct no.

The photographic block picture is undoubtedly the more truthful to nature, provided that all the conditions conducive to technical excellence have been fulfilled, as every gradation of light and shade is represented at its proper value; but still, those who have been accustomed to wood engravings complain of a flatness, and say that the outlines are not well defined, or rather that they lack boldness and decision.

These charges have a certain amount of truth, for the photographic engraving has all these faults in comparison with the wood engraving; unless, indeed, we may say that the wood engraving has the contrary faults when compared with the photographic engraving.

The fact is, that almost all wood engravers put in false and exaggerated outlines in order to lead the eye to the main objects in the picture. Let us suppose the case of a cubical box lighted from all sides and placed before a background of nearly the same tint: the draughtsman begins by drawing lines to represent the edges of the cube, and when these are done, he tries to introduce such shading as may be suitable; but the camera only reproduces the shading. These artificial outlines, which the wood engraver may regard as the main feature of a reproduction, are often in reality a mere index or pointer to the true picture. As long as the public prefer to have the index and the true picture combined, so long will they prefer the wood engraving to the phototype block.

It would be interesting to know who were the experts consulted in the framing of the new Copyright (Works of Fine Art and Photographs) Bill. From internal evidence it would seem as though the photographic publisher, and not the photographer, had had his hand in the matter.

On one point some photographers will be of the same mind as the publisher. This is Clause 20, relating to penalties on production and sale of fraudulent works. Unscrupulous men have been known to exhibit in their specimen cases as their own work photographs which they have purchased. We know an instance of a photographer of celebrity in connection with children's portraits being intensely gratified at seeing in the window of a provincial man, and put forth as the productions of the latter, several pictures of his own taking. Clause 20, we fancy, is capable of being construed so as to impose a penalty upon anyone exhibiting another man's work as his own.

The history of the first dozen plates tried by an amateur friend new to dry plate work is instructive. No. 1 fogged—light discovered entering dark-slide through an ill-fitting shutter. Dark-slide repaired before trying No. 2. Nos. 2 and 3 fogged—light between flange of lens and camera; remedy applied. Nos. 4 and 5 fogged—minute defect discovered in bellows body. No. 6 fogged—light entering camera through old screw-hole unplugged. Nos. 7 and 8 fogged—light of dark-room not sufficiently non-actinic. No. 9 fogged—door of ditto not light-tight. Nos. 10, 11, and 12 fogged—lid of plate box accidentally left open. He thinks by this time he knows a little about the causes of fog.

It is odd to read that in order to prevent crowding, a small fee will be charged for admission to Mr. Francis Galton's "Anthropometrical Laboratory" at the Health Exhibition. The long and mysterious title may perhaps stimulate curiosity, but if all the attraction when one gets inside is the filling up of a formidable schedule with personal particulars, the place will scarcely be crowded. The average person can scarcely be expected to furnish information such as Mr. Galton demands. Who knows his or her "height sitting and standing, strength of squeeze and pull, swiftness of direct blow, acuteness of vision as measured by a test type," &c.? Of course, if you are enabled to be enlightened on these points at the laboratory, it may be worth a visit; but the thing would be more popular and satisfactory if Mr. Galton photographed every visitor, keeping a copy himself, and giving one to the sitter.

When Dr. Vogel was in America last year, his attention was directed to albumenized paper, and he told us that paper which answered well in Europe was very often unsatisfactory in the United States. He ascribed the failure to lack of moisture, and was of opinion that the atmosphere of the States was, as a rule, too dry for paper of European

manufacture. In Algeria, however, it seems, photographers are very content with the ready-sensitized paper they receive from Europe in round tin cases, and in some instances the material, we are assured, keeps six months without discolouration. On a recent occasion we certainly saw some samples prepared in Paris which were as white as home-sensitized paper.

Between the Health Exhibition and its title a wide gulf exists, unless, indeed, one may act on the undoubtedly correct idea that everything mundane bears on health and should be included. But why include whole streets which consist of the shops of lollipop makers, grocers, cheesemongers, confectioners, feeding-bottle makers, florists, bird stuffers, electro-plate manufacturers, and coffee-mill makers, and give no prominence to the technology of the healing art as exemplified by pharmaceutical products or processes, and the wonderfully perfect mechanical appliances used by the surgeon; to say nothing of such exhibits as might be calculated to instruct the public in those numerous and laborious researches which have almost raised medicine to the rank of a science?

As it is, we have little more than a number of stalls of the "Aquarium" type, added to a large fag-end remaining over from the Fisheries Exhibition.

As an example of the extensive use to which photographs are put by the exhibitors for advertising purposes, we may mention the case of a seedsman surrounding his stall with large, but not very good, photographs of his products and premises.

"Do you make any charge to the dramatic profession for photographs? I require some for professional use only, and have heard you very highly spoken of, and should be glad if you would drop me a line."

So writes the manager of a travelling company to a provincial photographer of good standing; but the reply was eminently unsatisfactory, as merely indicating the usual charges, and expressing a desire on the part of the writer to know if the manager kept his house always open to the members of the photographic profession.

There is a sharp competition going on just now among American makers of dry plates. Two firms are offering 600 dollars, and one firm 500 dollars, for the best work produced on their dry plates, the prizes to be awarded at the forthcoming Cincinnati Convention.

A modest photographer in the provinces, who is diffident about asking his sitters for payment beforehand, gets over the difficulty this way. He has in the studio a neat tablet, having on it the inscription, "Previous payment is in all cases requested." This is hung just about the spot where the sitter should look, and it is the easist matter in the world to say, "Kindly turn your eyes in this direction," and indicate an imaginary spot just below the tablet. As he truly remarks, those who have already paid won't mind, and those who havn't, may take the hint.

A French amateur told us a home truth the other day, which landscape photographers will do well to note. His complaint was, that in taking pictures for sale, the photographer frequently destroys the *point de vue*; that is to say, that if there is a fine view from this bridge or that pass, he is not content to set his camera on a level with the eye, but must needs employ a very high stand—sometimes a pair of steps fifteen feet high—whereon to set his camera. The consequence is, that although he may possibly see a waterfall to better advantage, or get a finer view of a palace, the photograph is not so familiar as it would otherwise be. The visitor or tourist does not recognize the picture at once—there is something unsatisfactory about it that he cannot explain—and hence he sometimes objects to purchase.

For tourists, as a rule, like to buy what is familiar to them. No doubt many who visit Rome, or Naples, or Paris, as the case may be, select a few pictures of public buildings to take back with them, without much question as to *point de vue*. But others again, there are, who do not buy a photograph unless it shows them a scene exactly as they have seen it. This class does not run after photographs, but seeing a picture that will be a perfect souvenir to them, they buy without hesitation. Our French correspondent gave it as one reason why he carried a camera, that he could not always purchase photographs taken from a standpoint with which he was familiar.

It is surprising how little use is made in the studio of the silver birch. It is a wood that is practically valueless to the carpenter, and may therefore be purchased at a nominal price. Yet the picturesque markings on the bark, which are eminently photographic, render it very suitable for studio accessories when rustic surroundings are desirable. Still, as its effect is somewhat florid, it behoves one to study its use a little.

Thus, a fair-haired girl, habited in a straw hat and summer attire, would accord well with the thin, elegant stem, and silvery markings on its bark, whether the birch wood was employed in the form of a tree-trunk to hold or lean against, or in the shape of fence, stile, or rustic bridge. On the other hand, a dark beauty, with more sombre costume, might be better harmonized for an outdoor picture with a pine trunk, such as Mendelssohn employs with excellent effect in many of his pictures.

It is impossible, of course, to make very much headway in a science without a thorough grounding in its theories; still, there can be little doubt that one of the best ways to impart knowledge is to connect in the student's mind some practical application of it. Sometimes this is difficult, if not out of one's power altogether; but still, where feasible, it is the best way of giving instruction. A student, if he once gets interested in the application of a science, will then follow it of his own accord, and require no further incentive. This is exemplified in the lecture-room every day; if there is nothing visible but the green baize lecture table and a glass of water, the young student fails in interest from the commencement; if, however, there are plans and diagrams

or apparatus and models visible, to supplement the lecturer's words, then scholars are all attention from the commencement. Photography, to take an instance, is a wonderful incentive to the chemical student, just as telegraphy is to the student of physics; every one who takes to a branch of applied science of this character ceases at once to be a passive student, and becomes an active one.

Patent Intelligence.

Applications for Letters Patent.

8351. LEON MILTIADES MESSINESI, 16, Philpot Lane, London, Middlesex, Merchant, for "Improvements in photographic apparatus."—Dated 28th May, 1884.

8463. SAMUEL DUNSEITH MCKELLEN, 18, Brown Street, Manchester, Lancashire, Watch Manufacturer and Jeweller, for "Improvements in photographic cameras."—Dated 31st May, 1884.

8470. JOHN JOYNER, 408, High Street, Cheltenham, Gloucestershire, Artist and Photographer, for "Improvements in the photographic camera for travelling purposes."—Dated 31st May, 1884.

Specifications Published during the Week.

3026. J. and A. G. HOPKINS, "New apparatus for the exposing of photographic sensitive plates in cameras."

Our invention as above, to be designated hereafter as the Simplex Slide, and Reversible Camera Back, consists of a perfectly light-tight box or slide, made so as to receive the sensitive plate in a carrier, which said carrier is made to run in grooves in slide, and which cannot get displaced when putting in or taking out plates; this said slide is made perfectly impervious to light by means of a simple lid affixed to the plate-carrier, in such a manner that when the said carrier containing sensitive plate is pushed home into the slide, and by means of a simple turn of screw let in on top of slide, into a screwed plate on plate-carrier to keep it fixed, it becomes perfectly proof against light. The camera-back is so made, with an opening on top the exact size of the plate slide, which, when exposure is to be made, it is fixed thereto by means of two levers each side of back inserted in small grooves made in plate slide, which by this means makes the whole perfectly rigid. The exposure of plate is made by simply removing the small screw on top of slide, and inserting a rod with screw at end, so as to screw into plate-carrier, by which means the plate is let down or drawn up at will of operator; the said rod to be just the length of slide, so that by simply pushing the plate-carrier down in grooves into the said back, the sensitive plate is kept in position by means of a spring which is attached to back of plate-carrier; the plate is then ready for exposing. The camera-back is made with a door, so that the focussing-screen can be inserted or taken out without interfering whatever with plate-slide when attached to camera-back, so that the focussing of a subject and exposure of plate on same becomes a most simple and very easy method, and very quickly done. Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. The plate-carrier, with spring back, and light-tight lid affixed.

2. The slide or box to receive plate-carrier.

3. The arrangement of rod with screw end passing through top of slide into a screw-plate on carrier for bringing into position the sensitive plate into camera-back for exposure, and then also into slide after.

4. The arrangement of the screw passing through top of slide into screw-plate of carrier, for keeping slide impervious to light when closed.

5. Reversible camera-back, made with an opening to receive plate-slide.

6. Levers on camera-back, for making slide quite rigid when brought into grooves of slide.

7. Method of inserting focussing-screen into camera-back without interfering with slide while attached to the back.

8. The camera-back can be made to fit any camera, and any number of slides can be used with same.

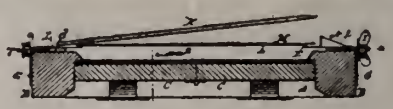
5045. ALFRED JULIUS BOULT, of 323, High Holborn, in the County of Middlesex, Engineer, "Improvements in rings for containing portraits, or the like." A communication from Emmanuel Diamant, of Budapest, in the Kingdom of Hungary. —Dated October 23, 1883.

This invention relates to an improved construction of a ring, so made as to contain or enclose two or more miniature portraits, or the like. In making a ring for four portraits, the bezel carrying the stone, or a plain or ornamental plate, is hinged to the ring, and on the underside of this bezel or plate a frame of a suitable kind, preferably one that can be removed at will, is affixed to receive one picture. Another frame is placed upon the body of the ring just below the hinged plate or bezel, so that these two are, when the hinged part is closed down, hidden or covered by the stone or other ornament. The hinged part may have any convenient kind of fastening to keep it closed. At each side of the hinged top there may be another hinged plate covering a frame to contain a picture, and these two side plates may either be kept down by the plate under the stone, or have separate fastenings. All the places may be so fitted that they will fly open (simultaneously if suitably arranged) upon their fastenings being released. If two portraits only are required to be inserted, the two side plates and the frames underneath the same are omitted.—*Provisional Protection only.*

Patent Granted in America.

298,901. OLIVES PERRY SCOTT, Quincy, Ill. "Printing and Vignetting Frame. Filed, April 28, 1883. (No model.)

Claim.—1. The combination, with a printing frame, of a housing or vignetting attachment fitting over said frame, and adapted to be vertically adjusted thereon, having the central opening and the skeleton frame, the said wire frame being



attached to the housing, and operating to hold the paper, substantially as described.

2. In combination with a printing frame, a vignetting attachment consisting of a housing fitting over said frame, and provided with a central opening, slotted sides, and thumb-screws for the adjustment of the attachment, the skeleton frame for holding the paper in place, and the spring or springs beneath the said vignetting attachment, to force it upward from the frame, substantially as described.

THE SILBER LAMP.

BY C. L. FIELD.

I WILL content myself with giving a brief description of the Silber lamp. At first sight the burner appears to be a simple aggregation of concentric tubes—and this, in fact, it is. The use of these, especially the innermost, bell-mouthed pipes, becomes very apparent in the lighted lamp. From the right hand one of these two lamps, both burning petroleum, with equal wicks and similar chimneys, I remove the interior tube—immediately the flame lengthens and darkens, wavers and smokes. The current of air which is, by this internal conduit, directed into the interior flame surface, is the essential principle of Mr. Silber's invention. The wick is contained in this metal case, surrounded by an air-jacket, which passes down the entire length of the lamp, leaving a small aperture at the base, through which the oil flows from the outer reservoir to the wick chamber. Thus, by the interposition of an atmospheric medium, the bulk of the oil is maintained throughout at a low temperature. Two concentric bell-mouthed tubes pass down the interior of the wick case, and communicate with the air at the base of the lamp, which, you see, is perforated for the purpose. Two cones, perforated, the inner and smaller throughout, the largest only at the base, surround the wick, and heat the air in its passage through the holes to the flame. The effect of these appliances is, firstly, by the insulation of the outer reservoir, to avoid all danger of vapourisation of the oil, till actually in contact with the wick. As it is drawn nearer and nearer the seat of combustion, the hot metal wick-holder heats, and ultimately vapourises the luminant, so that at the opening of the wick tube concentrically with the air conduits—all of which are exceedingly hot—a perfect mixture of vapour and hot air is

formed, and this it is that is burnt. An all important feature is the shape and position of the chimney, which, Mr. Silber asserts, influences the flame to the extent of quadrupling its brilliancy if properly adjusted. The numerical results obtained by the photometry of these lamps, as to brilliancy and price, are truly gratifying. I refrain from quoting disjointed values and beg to refer you to two tables given in Mr. Silber's paper.

I cannot enter into all the beautiful applications of this principle, with which the Silber Light Company have so kindly and bountifully supplied me. But upon this marine lamp, as it involves certain important modifications, a few moments may be spent with advantage. Its purpose is to maintain an even and steady light, during a violent tempest, with, it may be, waves dashing over it. Fig. 1 shows you this lamp, with the top

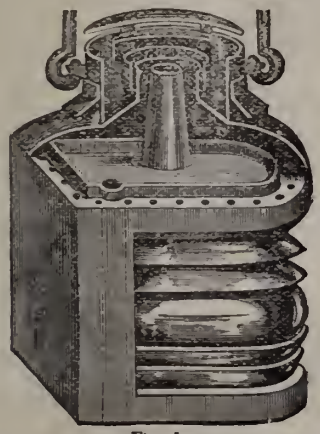


Fig. 1.

ssected. It is provided with a cut dioptric lens, and a powerful reflector, and the light, which is equal to that of fifty candles, can be seen on a clear night for more than five miles. Fig 2 shows

Fig. 2.

the interior of the lamp, in a glass model made for the purpose. The air enters a chamber, by means of two tubes, about one-third of the height of the chamber itself, perforated. This checks aud dissipates the most violent current. After entering, the air expands with the heat, loses much of its velocity, and, being still cooler than the air inside, above the flame, descends to the chamber below the burner (Figs. 3, 4). As the heated products ascend, the fresh air is drawn up to the flame to supply their place. The smoke from this paper will best show the direction of the currents. You observe the rapidity with which the smoke rushes into the air-pipe, and enters the chamber, which velocity gradually diminishes in ascending, till it falls over, and descends to the lower chamber, whence it is drawn up and consumed in the flame. I direct a stream of air from this powerful bellows against the inlet, and the flame you see as steady as ever. The products of combustion pass up a conical chimney, and strikes against the apex of an inverted cone, which divides the current, and allows the products to pass out on every side. Above the cone is a horizontal plate, projecting on all sides beyond the cylinder it covers, and somewhat convex. This serves to divert any water that might pour upon it innocuously away. This cover has a space between it and the base of the

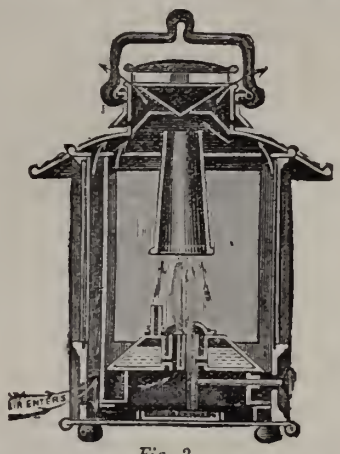


Fig. 3.

cone, so that any horizontal air-current striking against the top of the lantern passes through this aperture, meeting less resistance than if it chose the downward direction. As this

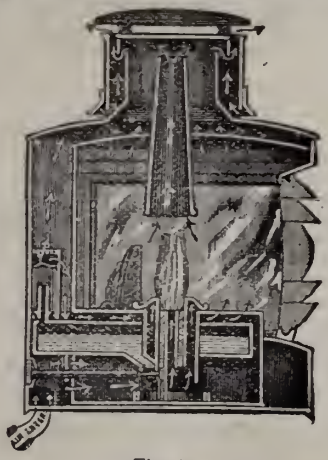


Fig. 4.

sweeps away the products of combustion from the top, a gust of wind tends rather to increase the brilliancy of the flame than otherwise.

These lamps have been tested in ships, high towers, express trains, and in every case successfully. As the carefully-adjusted metal funnel renders a glass chimney dispensable with, there is no part which is liable to damage. The one great point to be observed is keeping the whole case air-tight, except at the legitimate outlets; for, you perceive, when I open the door at the back, be it ever so little, the perfect equilibrium of supply and combustion hitherto obtaining, is disturbed, and the flame wavers and smokes.

ON THE DEVELOPMENT OF INSTANTANEOUS PICTURES.

BY W. A. WATTS.*

Mr. R. CROWE, in his interesting remarks upon the subject last month, divided instantaneous negatives (by which I presume are meant those taken by the aid of a quick-acting shutter) into three classes. Now, I accept his principle, so far as believing that all instantaneous negatives are by no means to be treated alike; but would prefer to make *two* divisions only, namely, fully-exposed and under-exposed negatives. There is one class of instantaneous negatives which, requiring only a very brief ex-

* A communication to the Liverpool Amateur Photographic Association.

posure, have by means of the shutter received quite as much as they need. Such are sea-views, which I look upon as instantaneous pictures merely in name—that is to say, they are as fully exposed by action of the light lasting only a fraction of a second, as the average of plates where there is nothing to limit the amount of exposure but the photographer's own judgment.

In Mr. W. K. Burton's table of exposures I note that, for a view containing open sea and sky in good light, the correct exposure with a lens of f_8 (about the aperture of the No. 1 stop of a symmetrical) is given as $\frac{1}{40}$ second; whilst, when the lens is stopped down to f_{16} (about the No. 4 stop), the exposure ought still to be as little as $\frac{1}{10}$ second. It may easily happen, therefore, that even with a quick shutter such a picture may be rather *over*- than *under*-exposed, and, consequently, may demand the treatment suitable to the former rather than to the latter class. For such negatives the treatment Mr. Crowe lays down for his first class is no doubt exceedingly well suited, although I must confess that my own experience leads me to believe that there is no advantage (and probably no disadvantage) in the preliminary soaking in pyrogallol over plain water, and that the essential point of his developer is rather in the relative proportions of pyro., bromide, and ammonia being especially well suited to the peculiarities of the subject.

I would take, however, as my second class of instantaneous negatives, those where, had it been convenient, a longer exposure would have preferably been given; and, where only the exigencies of the subject have necessitated an exposure of so limited a duration, that objects in motion may not seriously spoil the picture or may even be taken with good definition, such as street views or a train in motion, the latter being a subject which most amateurs have, at some time or other, been tempted to attack. Such negatives, I think, need a different treatment, and the method I advocate is to soak them before developing in dilute ammonia.

Probably the most convenient method of employing this mode of development—at all events, of those who use the more scientific method of separate ten-per-cent. solutions— is to add the correct amount of ammonia to the full quantity of water to be employed, and to leave the plate soaking in that whilst measuring out the pyro. and bromide solutions (which may of course be in the relative proportions that experience suggests as suitable to the class of subject and make of plate); then return the ammonia solution to the developing cup, and flood the plate with the mixture. Thus if developing a quarter-plate, and using three grains of pyro., two minims of ammonia, and one grain of bromide—which, I believe, is an average formula—I should take twenty minims of ammonia to one ounce of water in which to soak the plate, and while soaking place in the developing cup thirty minims of pyro. solution and ten minims of bromide solution, return the ammonia to the cup, and finish development in the usual way. In my own practice, however, as I use Edwards's method of developing, in which the ammonia and bromide are mixed in one bottle under the name of "accelerator," I soak the plate in water containing a few drops of ammonia whilst mixing the usual developer, throwing away the dilute solution of ammonia, or keeping it for the next plate, and developing with the mixture in the ordinary way.

In case any of our members should not have employed the sulpho-pyrogallol solution, I may perhaps, in passing, advert to the great convenience of that mode of employing pyrogallol, particularly for an under-exposed plate, where a good deal of forcing may be required. The sulpho-pyrogallol solution permits the addition of a good deal of extra ammonia when necessary, and of a very prolonged development without any staining of the plate. I took an opportunity, whilst at New Brighton of exposing three plates with a drop shutter working in about one-twentieth of a second on the same subject in rapid succession, so that the light might be presumed unaltered. One of these plates then received a preliminary soak in ammonia and one in pyro., the two being afterwards developed together in the same dish with the same solution. The third plate was developed without soaking in either pyro. or ammonia, but with the same proportions as the other two; only one half of that plate was soaked in water and the other half remaining dry, in order to test the question whether soaking in water was to be taken as an advantage or a disadvantage.

On developing, the negative soaked in ammonia began to come up in ten seconds, and was finished, as I judged, in nine and a-half minutes from the time of commencing, when it was removed from the developing dish, leaving the other one still developing. The one soaked in pyro. showed no signs of development until eighty-five seconds had elapsed, and was not finished until it had been in the dish for twelve and a-half minutes. The third plate, half soaked in water, began to show signs of action on the unsoaked side in ninety seconds, and on the soaked side not till the expiration of 150 seconds. As it was inconvenient to remove the one-half from the dish before the other, both were pronounced finished at the same time, namely, in sixteen minutes.

The result is that the soaked side is perhaps a shade less dense than the unsoaked one, but is, I think, somewhat clearer. A print is before you, and I will leave you to judge which side shows the advantage, if any. In developing these three plates I used Fry's plates and employed Fry's ordinary developer, taking care that each plate was subjected as nearly as possible to the same treatment. I did not, therefore, vary the solutions, and arrested each when it had attained the same degree of density as the first. It might, perhaps, have been in some respects a fairer test had they all been developed for the same period of time. I, however, exposed another plate to an exactly similar subject at the same time of day, but a somewhat different point of view, and that plate I developed according to the best of my judgment, first soaking in ammonia and, when partly finished, adding a double portion of accelerator. This began to come up in ten seconds, was finished in nine minutes, and I think is undoubtedly the best of the four.

Probably the exposure was not very insufficient, as the view was brightly lighted, and I gave about $\frac{1}{20}$th second with an aperture of f_8. With less illumination or more rapid exposure the difference between the two methods would probably have been more marked. The fact, however, that one negative attained a certain density in nine and a-half minutes, whereas with the same developer the other took twelve and a-half minutes to attain the same point, seems to me to show considerable gain in sensitiveness due to the preliminary soaking in ammonia.

In confirmation of these views as to increased sensitiveness under difficult circumstances of light, I may perhaps venture to call your attention to a print of a plate exposed during our recent visit to Rufford. The light on that occasion was so unusually dull as to cause us almost to despair of getting ordinary pictures, and when inclined to try a drop-shutter picture on a magnificent bull, the mere idea of getting any result seemed almost an act of lunacy. I ventured, however, upon the trial, and, although I certainly cannot say I obtained a picture, yet there is something to show, which would probably be considerably improved by intensifying the negative. So bad was the light that I should scarcely (but for knowing the effects of soaking in ammonia) have been surprised had the plate shown no result whatever, but been capable of being used over again. As Mr. Ellerbeck with a much quicker lens and, I believe, quicker plates (I use Fry's 20 times) took the same subject, perhaps if he would kindly show his result and explain his method of development it would be interesting.

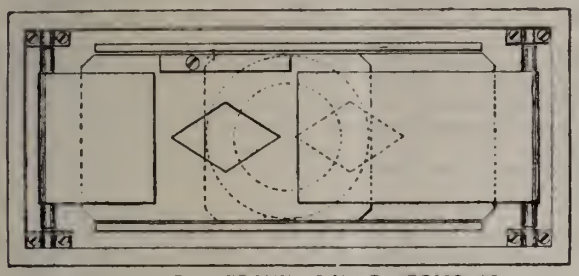
Another experiment bearing upon the same point is as follows:—At Easter of last year I took a very peculiar subject—a deep pot-hole in the limestone district at Settle. Some portions of the hollow were in deep shade. In another portion a stream of water falling over had frozen into a mass of stalactites with a hill of ice underneath, into a basin on the top of which the water fell; this portion and the masses of snow were in sunlight. On this subject I exposed two plates (Edwards's). One with a stop of f_{16} received four seconds' exposure; the second, with f_8, was taken with the drop shutter. The first was developed by Edwards's ordinary formula, whilst the second was soaked in ammonia. After finishing, the two plates were so much alike that it was difficult to distinguish which was which except by the numbers attached.

AN INSTANTANEOUS SHUTTER.

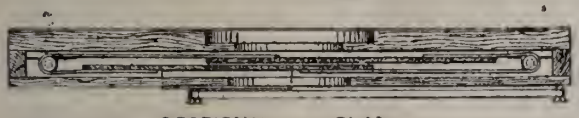
BY P. B. GREENE.

THE construction of my shutter is so well indicated by the drawings that little description is necessary. It consists of two flat plates of metal, hard rubber, or heavy cardboard, each with a diamond-shaped opening in the centre, and connected together at both ends by a flexible band passing around rollers which revolve in brass bearings attached by screws to the corners of outside case.

A strip of wood attached to the front slide by glue, or screws, or both, according to the material of which the slide is made, projects through a slot about twice its own length in the front cover, and has a rubber band or bands attached to it in the manner shown. It will be evident



VIEW WITH FRONT COVER REMOVED



SECTIONAL PLAN

that the full opening of the diamond is presented only at the instant when the two openings are exactly opposite, and that the aperture gradually increases from a point, and decreases to a point again. By varying the number or size of the rubber bands, considerable variation in speed can be attained, or it may be operated by hand, removing the rubber entirely. A coiled brass spring could be substituted if preferred. A slight modification in trigger would enable it to be released by a straight pull from behind camera, as in Mr. Burnham's shutter. By making the entire shutter of brass it could be made much thinner and some smaller every way, and, of course, somewhat more durable. But my aim has been to show how such a contrivance may be cheaply made, and by the photographer himself if he is at all handy at such work; old cigar boxes will furnish the necessary lumber, and a very heavy press-board will answer admirably for the slides; for the flexible bands thin leather will be the best—in fact, the bands and slides could all be made of one piece of leather of suitable thickness, and I not sure but this would be the best arrangement. The rollers can be made of heavy brass or iron wire, if nothing more convenient is at hand.

Correspondence.

THE ILLUMINATION OF THE DARK-ROOM.

Dear Sir,—As my recent article on the above subject stands apart from the adjourned discussion on Mr. Debenham's paper, and refers moreover to matters which, with one trifling exception, have been before the photographic world for some time, I need have little hesitation in replying to the remarks of Mr. Debenham in your last issue.

The main points in my article which Mr. Debenham has criticised can be replied to in a few words.

The spectroscopic test is not a complicated one, for by one simple operation, that of taking a photograph in the spectrum, it shows:—1. The rays which pass through a particular medium. 2. Their relative effect on the plate. 3. What rays should further be dispensed with, and with this, what sort of medium must be added to effect the desired object. Add to the spectro-photographic test an eye observation, and the relative illuminating powers of the rays which pass through are shown. If I did not make this sufficiently clear, I take this opportunity of stating the case plainly and briefly.

In my article I explained that the extent to which the spectrum could be impressed on a gelatine plate depends on the rapidity of the plate and the length of exposure. I also referred to this in No. VI. As I have already stated, there is no absolute limit, but the lower the refrangibility of the rays, the longer the exposure required. Mr. Debenham's correction, therefore, is superfluous. My diagram represents an average exposure, too long for the blue, and too short for the infra-red; besides, it must not be taken without the accompanying explanation.

The cathedral green I used (I have good authority for using the expression) was a yellow-green. To a large extent it *does* show a spectrum resembling the blue-green, but since it lets through less blue light than signal green, its tint is easily accounted for. It resembles the common yellow-green of my diagram, but is lighter in colour.

The recognized name of the stained red glass which Captain Abney uses is "stained red." I procured it under that name from Messrs. Willmore Bros., of Brompton Road.

The sensitive compound which photographers use in gelatine plates is not green bromide. Whoever has described it as such, did so in error. The difference between it and the bromide of silver in gelatine I have already laid stress on (see Article No. VI). In the series of articles I have been writing on the spectroscope, it would have been out of place to give details of known and recognized processes. Mr. Debenham will find full details in the Photographic News for November 10th, 1882, the formula having been given a few years before at the Royal Society. It forms the subject of the Bakerian Lecture for 1880, and Mr. Debenham will find that Captain Abney there states that a yellow light *would* be preferable for that particular sensitive film.

Whether Mr. Debenham has, or has not, demonstrated that green glass is a more powerfully protective supplement to stained red than cobalt glass, is a question which belongs to the adjourned discussion, and I therefore pass it over here.

I will beg to conclude with a protest against the idea, which seems to run through Mr. Debenham's letter, that my article was intended as an attack upon him.

With apologies for taking up so much of your valuable space, I am, dear sir, yours respectfully,

C. Ray Woods.

Dear Sir,—Now that dark-room illumination has become a matter for serious attention, I would like to say a few words in favour of cherry fabric used in conjunction with green cathedral glass.

Some time ago Mr. W. E. Debenham was good enough to send me samples of his green glass and orange paper, which I tried and used with some success; but afterwards, getting a batch of very rapid plates, I was induced to try cherry fabric in place of the orange paper, and I must say that the result has been most satisfactory. I have noticed that cherry fabric is very much more luminous than paper.

I should tell you, that as my window now stands, the cherry fabric is outside, and at a distance of about three inches from the green glass. Trusting that this may be of some use to someone or other, I am, yours, &c.,

Cherry and Green.

PAVLOFFSKI'S PHOTO-TRANSFER AND ENAMEL METHOD.

Dear Sir,—My invention has been described in your journal with such details that there is scarcely anything more to be added. I beg only to observe that the whole operation as described in your journal is generally performed on glass plates, but it can certainly be as well done on paper. The paper in such case is coated with sensitive solution in the same manner as with the ordinary carbon printing (tissue). It is self-evident that the sensitive paper can-

not be preserved longer than two or three days, as in consequence of the influence of the bichromate salts it becomes no longer soluble. In consequence thereof, I have lately made some new experiments (which proved very successful) by preparing paper covered with a mixture of colours, gum and honey, which can at any moment be made sensitive by merely immersing the same in a chromate bath (like gelatine paper). In making the mixiure one can use glucose, glycerine, and ordinary sugar, instead of honey.

I am thinking of occupying myself with the preparation of such paper for common sale. I intend making it of two kinds:—1. For transfers on wood, oilcloth, and the like surfaces, to be made with ordinary colours; and 2, for enamel photographs on porcelain, crockery, and other ceramic surfaces, to be made with porcelain colours. By this means the transfers of photographs on such surfaces as up to now offered great difficulty, will be extremely simplified, and besides such transfers will become accessible for everybody.

I would have liked to establish this enterprise on a large scale, as the demand for such paper is sure to be considerable, and it is to be hoped that the photographic art will then become a powerful assistance for decorative art.

It may in general be observed that up to now photo-ceramics is in a neglected state. There are some firms who prepare enamel photographs, but the means by which they procure them is kept the strictest secret. My communication, the authenticity and validity of which I guarantee, will break the fetters, and give to everyone the power of making these indestructible pictures, particularly when photo-ceramic paper appears for sale.—Yours faithfully.

St. Petersburg. V. PAVLOFFSKI.

RETOUCHING.

"Wanted, a Dark Room Assistant. Will be required to assist generally, and *do the retouching*."

"Wanted, an Assistant Operator, to attend to the printing; must be a *good retoucher*."

"Wanted, by a Young Man, a Situation as printer. Could take an occasional negative. Is a *first-rate retoucher*."

DEAR SIR,—The above are typical of advertisements we often see in the PHOTOGRAPHIC NEWS. In fact, it seems now that everyone connected with the studio must, and can, "retouch," as a matter of course; so retouching, and cleaning the studio windows, seem to be looked upon as kindred duties; and the question seems simply, "Of course, you can retouch?" and the reply, "Oh, of course I can."

If "retouching" means simply blocking a few freckles on the one hand, or by a mass of blacklead obliterating every trace of character or likeness on the other, then "retouching" is simple enough, and but little skill required to do it. But, to retouch well, to do just sufficient, and that with judgment; to correct the shortcomings of photography, where colour is concerned, as in the case of freckles and slight irregularities or spots of colour, deep lines of age, and many minor natural effects which photography magnifies, and, in many cases, misrepresents; and still to retain, unaltered, the character, expression, and correct likeness of the original, require the eye and hand of the artist. In fact, it is easier to paint a decent picture than to retouch a negative properly; and I venture to say that not one in five hundred (and that is a low percentage) who profess to retouch can do more than just spot out a freckle or pimple, or, doing more, spoil the portrait altogether. A good retoucher should have much artistic talent. The camera in judicious hands does a great deal, but it does a great deal *badly*; and it is to the *artistic* retoucher we must look for that character that renders portraiture at once striking and attractive. This being so, how very few "retouchers" are to be found, and yet how numerous they are supposed to be.

PLUMBAGO.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 29th ult., Mr. A. L. HENDERSON in the chair.

Mr. A. COWAN initiated a discussion on the effect of chrome alum in a finished emulsion, especially to find if it made any difference in development. He found that five grains added to forty ounces of emulsion before coating, not only permitted plates being washed with warm water without frilling, but in no way retarded development. Plates with and without the addition, which otherwise received the same treatment, were passed round; no difference could be traced either in detail or density.

Mr. W. COBB understood pyrogallol was employed by some dry plate manufacturers for a similar purpose.

The CHAIRMAN said the addition of chrome alum to certain gelatines was beneficial. No doubt those Americans who wash their plates in boiling water, use a substance of this kind. He preferred gelatine as soft as possible, short of frilling, and obtained the finest quality in those plates which were on the verge of frilling. Perhaps Mr. Cowan would experiment further, developing with warm pyro and a minimum of ammonia. He would also suggest, as another experiment, mixing chrome alum with meta-gelatine.

Mr. COWAN intimated that he would make further experiments.

The CHAIRMAN mentioned that the unfixed plates shown by him on the last occasion had been placed in the box wet and left there; upon opening the box that day he found the images had entirely disappeared. They had been developed with ferrous oxalate, slightly washed, then floated with very dilute nitric acid, and again slightly washed. He could not account for this extraordinary result.

Mr. W. E. DEBENHAM, in showing his lamp for working with composite white light, said he did not propose to show a light which was absolutely safe, but with suitable precautions it would be useful. By means of two lamps, emitting red and green light respectively, on a sheet of white cardboard, the reflected rays from this surface, after filtering through white tissue paper, were shown to be white composite light. A yellow reflecting surface was seen to make the light a little more yellow. Mr. Debenham then exposed portions of the same plate for one minute at a readable distance (*i.e.*, twenty-eight inches from the tissue screen) with each reflector; also with the lamps turned low enough to obtain the same luminosity, without the intervention of the coloured screens. Upon development it was noticed that an impression was obtained in the latter case, but not in either of the others.

Mr. H. S. STARNES found that light thrown on raw sienna and reflected back through yellowish-green media is safer than red glass or anything else he had met with.

The CHAIRMAN passed round a clamp with ball-and-socket joint, for attaching a camera to the rail of an omnibus or any position where a tripod is undesirable; a similar arrangement is also described on page 344 of this volume. A very pretty experiment was also shown by the Chairman, in which red and white light impinging on an opaque substance rendered complementary colours visible on a screen placed at a suitable distance beyond; by altering the distances, overlapping was obtained, and shadow produced. The Chairman also showed a plate of the "Start for the Derby."

It was announced that the "lecturette," "Altering the Density of Negatives," by Mr. W. Coles, would be given on the 12th inst.

BOLTON PHOTOGRAPHIC SOCIETY.

THE first out-door meeting of the season was held on Saturday, the 24th ult., at Adlington, near Chorley. The weather was beautifully fine and clear, and caused a good muster of members to assemble. About twenty (including some friends) left Trinity Street Station for Chorley, and thence walked on to Yarrow. As most of the members were fully armed for the photographic warfare, their appearance caused no little surprise to the natives. The woods behind Yarrow Hotel proved fertile in "bits," and the members soon began operations. Proceeding through the woods, the party emerged on the banks of the canal above Adlington. Not "striking oil," a start was made for the Bostonian's Elysium, Rivington. Plates were exposed on

the house and beautiful grounds of the late Mr. Martin, and it was getting late in the evening when a réunion was made at the "Black Lad" for tea, after which, and a stroll around the lakes, a start was made for Horwick Station, and Bolton was reached about nine o'clock.

The next meeting will be at New Brighton.

Derby Photographic Society.

At a meeting held at Rodney Chambers, Corn Market, Derby, on Wednesday, May 28th, Mr. Arthur J. Cox in the chair, the Derby Photographic Society was formed. About twenty members were enrolled, and the Society shows every prospect of being a most successful undertaking.

Among those elected were Messrs. Charles Abney, Richard Keene, Arthur J. Cox, H. Arnold Bemrose, J. E. Kaye, J. W. Price, and T. Scotton.

Mr. Fred. W. Simpson, Hamilton Villas, Mill Hill, Derby, was elected Hon. Sec.

The first meeting will be held this month, when a paper will be read on some photographic subject by a member of the Society, and will be followed by a discussion.

Photographic Society of Ireland.

The closing meeting of the session 1883-4 was held in the Royal College of Science, Dublin, on Wednesday, 28th ult., Thos. A. Bewley, Esq., in the chair.

Mr. Howard Grubb, F.R.S., delivered a most interesting and instructive discourse on photographic lenses, in the course of which he described by means of figures on a black board the nature of lenses in general, and their action in refracting the rays of light passing through them. He next referred to the various errors arising from spherical and chromatic aberration, astigmatism, &c., and the various means adopted to eliminate such errors in the different forms of lenses used in photography.

In the discussion which followed, the Chairman, Messrs. J. T. Robinson, H. Bewley, E. P. Johnson, G. Pim, and others took part.

M. Richard C. Walker exhibited a very light and compact single "back" which he had made entirely, except the skeleton, of Willesden paper, and which was much approved of.

The meeting then adjourned to October.

Liverpool Amateur Photographic Association.

The monthly meeting of this Society was held at the Free Library, on Thursday, the 29th ult., Dr. Kenyon, President, in the chair.

The minutes of the May meeting having been read and confirmed, Messrs. Cross, Heape, and Stott were elected members of the Association.

Mr. A. Beer exhibited and explained a new and very ingenious changing-box.

Mr. E. Roberts showed a fine negative developed by himself with—

Washing soda	1 ounce
Bromide of potassium	3 grains
Water	10 ounces
Pyro	10 grains

This formula had been given in the present year's Almanac, and Mr. Roberts said he found it a capital developer, giving clean negatives of good printing colour and density.

Mr. J. H. Day remarked that an artist friend of his had used the soda developer exclusively for some time with the very best results; but he (Mr. Day) would like information as to rapidity of action.

Mr. Roberts said that he had only used this formula with some Swan's plates which he had kept by him for some two years, and with these plates he certainly found it slow; but possibly it would not differ from other developers in this respect when fresh plates were used. There was perfect freedom from fog.

Mr. Rogers and the Chairman exhibited specimens of Mr. George Smith's sciopticon camera. This little camera measures when folded $2\frac{3}{4} \times 5\frac{3}{8} \times 4\frac{5}{8}$, and weighs under $1\frac{1}{4}$ pound; yet it carries a $3\frac{1}{4}$-inch square plate, and has a range of focus of from $2\frac{1}{2}$ to 12 inches. The double dark slides are correspondingly light, and the whole work in the most simple and yet rigid manner; there is a rising front and a swing back. The great novelty is the manner in which the extra range of focus is provided for without detriment to the field of short-focus lenses, and in this respect the pattern is the very model of perfection.

The Chairman called attention to some good prints of portraits and groups taken by Mr. H. N. Atkins with one of Smith's cheap single lenses.

Mr. Watts read a paper "On the Development of Instantaneous Pictures" (see page 363), and passed round a number of prints in illustration of his remarks.

The Chairman, in proposing a cordial vote of thanks to Mr. Watts for his careful and useful paper, remarked that he (the Chairman) had little doubt but that the principle enunciated was the correct one, and would in practice be found of substantial benefit. This was testified to by the relative times occupied by the development of the negatives exhibited, and to some extent by the relative densities of the negatives; but as to detail, it was noteworthy that the difference between the negatives exhibited in this respect was scarcely appreciable. This corresponded with the recorded experience as to different proportions of bromide in the developer, viz., that a large proportion of bromide, although it lengthened the period of development, produced no real loss of detail.

Mr. H. N. Atkins had, since the last meeting, been experimenting in the direction pointed out by Mr. Crowe in his valuable remarks at the April meeting, and found his formulæ work admirably.

Mr. Watts said that he thought it important to use sulphite of soda in fresh solution of pyro., and alluded to the tendency of sulphite to change to sulphate if the solutions were kept too long.

Mr. Crowe exhibited some specimens of his instantaneous work, taken in the streets of Liverpool on the Queen's birthday.

The Chairman explained a new apparatus by Lancaster, of Birmingham, for affixing a camera to a bicycle.

The meeting, which was numerously attended, was then adjourned to the last Thursday in June.

Talk in the Studio.

Photographic Society of Great Britain.—The last ordinary meeting of this Society for the present session will take place on Tuesday next, June 10th, at 8 p.m., at 5A, Pall Mall East, in the Gallery of the Royal Society of Painters in Water Colours, when the discussion on Mr. W. E. Debenham's paper, read at the last meeting, will be taken, and papers will be read on "Commercial Fabrics Suitable for Dark-Room Illumination," by Mr. J. R. Sawyer, and on "Silver Prints," by Mr. E. Dunmore.

Two Balloon Ascents.—Mr. Cecil V. Shadbolt writes:—"We launched our new little balloon of about 26,000 feet capacity from the Crystal Palace on Saturday. It is only just finished, and this was its first ascent. A splendid little beauty she looked, too, when inflated—alternate gores of red and yellow, and carried three of us easily with good supply of ballast. We have not named it yet, and the name reported in the *Daily News* is, therefore, incorrect. It is a very light little machine, a good deal lighter than the 'Sunbeam.' We let go at about 5.20, and rose steadily into the air. There were in the car General Brine, Mr. Dale, and myself; but the weather being unfavourable for photographic work, I left my apparatus on *terra firma*, and contented myself with flying two pigeons from 2,000 and 1,500 feet respectively over Croydon. These birds went down without any apparent fear, the first reaching its home at Chislehurst in about two hours; but the second one did not get back till after dark. We had a thoroughly enjoyable voyage, and very nice descent at Woodcote Grove, Wallington, in Surrey, where we were hospitably entertained by Mr. Puckle and his son, in whose grounds we alighted. These gentlemen not only sent one of their own carts for the balloon, but, after taking us to their residence and giving us refreshment, turned out their new waggonette to send us to the station—all honour to them!" It is reported that on the same day an ascent was made at Lille. The car, when about 40 metres from the ground, became detached from the balloon and fell to the earth. Twenty persons were in the car, of whom three were killed on the spot, and several others injured. The accident was due to over-loading, the car being only constructed to hold eight or ten persons.

Lime-light Explosion at Drury-Lane Theatre.—An explosion occurred during the morning performance at Drury Lane on Wednesday, which, although slight in itself, nearly

caused a serious panic. The lime-light apparatus in a room under the stage in some way got out of order, and the oxygen is supposed to have escaped into the hydrogen bag, so that an explosion ensued. The noise was not startling, as heard in the auditorium, but the clouds of dust, looking like smoke, which permeated the theatre, would undoubtedly have led to an alarm of fire had not Messrs. Emerson and Sweatman, two of the end men of Haverley's Minstrels, who were in the midst of their "business," interpolated a wheeze, which led the audience to suppose that the explosion was part of the performance. Emerson said, "Did you bear my trunk fall then?" Sweatman answered, "No; that's too heavy for your trunk." The two men in charge of the limelights were injured, and at once removed to Charing Cross Hospital.

PHOTOGRAPHY AND PERSIAN CALIGRAPHY. — Dr. G. W. Leitnee, in a recent communication to the *Society of Arts*, said: "Here is a *Hitopadesa*, which, in print, costs 7s. 6d., and which may be brought out by means of photography for a shilling. It is beautifully done. Here, again, is a Koran produced by a similar process. Surely those in India who practise caligrapby—and it is an art taught by absolute rules as to the distance of the dots between the curves of letters, &c.—are not wrong when they pay so much attention to it; and the lithographs of India, which spread education so cheaply, would be worse than they are—and some of them are very beautiful—if that art were not cultivated. Here is a Persian book, brought out by a relative of the Shah, correcting the pictures that are drawn in it of ancient rulers by corresponding coins. The Shia Mahommedans, it may be incidentally stated, allow pictures of living objects, the Sunni Mahommedans do not; at the same time the latter cultivate the design of inanimate objects. When it is alleged that pupils in Government schools do not object to pictures, it is evidently forgotten that the first thing a Mahommedan boy does in a Government school is to drive his pen or a bit of wood through the eye of a picture of a human being, in order to reduce it from the condition of an animate being to that of an inanimate object."

A STORY FROM ST. LOUIS.—*Walzl's Monthly* is responsible for the following:—"A man who was unable to read or write was in St. Louis, where he was a complete stranger, and wished to draw money from a bank in Texas where he had an account. He could not identify himself in any of the ordinary ways, and he was asked to have his photograph taken. When this was done it was attached to a check upon which he made his mark and was forwarded. A telegram was sent back to pay the check, and the man got his money by means of his photograph."

STAINING WOOD.—A wash of one part nitric acid in ten parts of water will impart a stain resembling mahogany to pine wood that does not contain much resin. When the wood is thoroughly dry, shellac varnish will impart a fine polish to the surface. A glaze of carmine or lake will produce a rosewood finish. A turpentine extract of alkanet root produces a beautiful stain which admits of French polishing. Asphaltum thinned with turpentine makes an excellent mahogany colour on new wood.

PHOTOGRAPHIC CLUB.—At the next meeting on June 11th, the subject for discussion will be "On the best Methods of Preserving Sensitized Paper." Saturday afternoon, meeting on Hampstead Heath, North End, and West Heath; meet afterwards at the "Bull and Bush," at 6.30.

To Correspondents.

*** We cannot undertake to return rejected communications.

LEICESTER.—1. Sulphite of soda, about 120 grains; carbonate of potash, about 250 grains; and washing soda, about 150 grains. 2. Your second question is not quite clear. Do you wish to know the relative quantities of the two salts which will decompose each other?

H. DE RUSELL.—It is very good of you to call our attention to the matter, but you will find a word or two regarding the subject on page 344.

W. FIELD.—1. The Asser process is not covered by any patent, and if you have had moderate experience in general photographic work you should succeed very well. 2. We quite think that the process adopted in the case of the lion should serve your purpose, but certainly do not think the specimens which you send very good.

J. GEORGE.—Thank you for the catalogue and particulars. We are sorry that dissatisfaction has been expressed, but such a condition of affairs is by no means exceptional.

CAMAS.—Directions will be found in Pritchard's "Studios of Europe," and you can obtain this from our Publishers.

PYRO.—So many circumstances may occasion a want of brilliancy, so that we can do no more than to suggest that it may arise from over-exposure, diffused light in the enlarging room, a disordered bath, or the presence of ammoniacal fumes in the locality where the development is performed.

W. T. W.—1. The firm has a place of business at Leeds, and it will be quite sufficient for you to address your letters to them at this town. 2. As far as we know, it has not yet been made commercially.

AD. EGGIS.—We would do so with pleasure, if we knew where to lay our hands on it, but we fear it has been thrown on one side, and lost sight of.

R. D. B.—1. All details will be found in Eder's "Modern Dry Plates," and Abney's "Photography with Emulsions." 2. Try very much diluted hydrofluoric acid, if you think it is worth the trouble.

NOVICE.—Under the circumstances, you must either use another sample of paper, or else the usual sensitizing bath, as the colouring matter appears to be one which will not withstand the action of the nitric acid.

A. C. ELWES.—For such a large window it may be necessary to have further protection in bright weather, say one thickness of the "Golden Fabric," in addition to your present covering. This material might be nailed on a light frame so arranged as to be readily placed in position when required.

TECHNIKER KRAUS.—You should state more definitely what you require.

SAMUEL KIRK.—You will see how far we have been able to make use of the information. Thanks.

J. H. C.—The pictures are very fairly good, and if they represent your average work you should have no difficulty in getting such a situation as you wish for.

DR. C. SCHLEUSSNER.—The address of Mr. A. L. Henderson is King William Street, London Bridge.

ENGRAVER.—In all ordinary cases, the bleaching of the engravings may be satisfactorily effected by a solution of the so-called chloride of lime, to which a little nitric acid has been added in order to set free the hypochlorous acid. Stir an ounce of the chloride of lime in a pint and a half of cold water, and strain through fine calico, after which add a drachm of nitric acid. Immerse the engravings one at a time in this fluid, and, as soon as the yellow spots have disappeared, rinse them thoroughly in several changes of cold water. Any trace of chlorine or hypochlorous acid remaining will cause the paper to become rotten, and it is therefore well to give the rinsed prints a dip in a 10 per cent. solution of hyposulphite of soda, after which they should be rinsed once more. It is seldom that a satisfactory negative can be obtained from an old and discoloured engraving, unless a bleaching process is resorted to.

S. C. RILEY.—We shall look forward to another opportunity.

E. G. M.—1. Although the earlier experimentalists arrived at widely differing conclusions, we think that the discrepancies have been sufficiently cleared up by the more recent investigations of Captain Abney regarding this point. 2. Under the circumstances, you might venture to write to him, and you can send a letter, under cover, to our office. 3. It was described in the NEWS about three months ago, but it is in reality founded on an old process invented by Mr. Robert Hunt many years ago.

NITRATE.—It is not sufficiently soluble in alcohol for the purpose.

The Photographic News Registry.

Employment Wanted.

Op., Printer, Toner, Retoucher.—Bromide, 133, Union-rd, Newington, S.E.
Manager & Operator.—M., Mr. Nicholls, 11 gh-st., Shanklin, I.W.
Ret., Artist in Oil, Water, Monochr me.—F. G., 3, Kenyon-ter., Clapham.
Reception Room, Spotter, Mounter.—L. S., 45, Gt. North-ter., Line.
Retoucher (gentleman), first-class.—A. B. C., *Photo. News* Office.
Printer, Toner, Retoucher.—H. H., 64, Drayton-gar., S. Kensington.
Reception Room.—R., 19, Torrens-rd., Hayter-rd., Brixton.
Tinting, Spotting, &c. (lady).—A. G., 5, Heaton-vil, Heaton-rd., S.E.
Operator and Retoucher.—E. Wilkinson, 5, Fair-st., Cambridge.
General Assistant.—W. W., c/o Mr. Wood, Folly Hall, Huddersfield.
Operator, £3, for permanency.—Lux, 30, Mornington-rd., New Cross.
Retoucher, Finisher (lady).—L. F., 30, Swanmore-rd., Ryde, I.W.
Reception Room and Retoucher.—A. B., 72, Azenby-sq., Peckham.
Operator or Gen. Assist.—F. W. Dodge, 12, Langland's-st., Kilmarnock.
Operator, dry-plate, studio and field.—H. S. L., 203, Mayall-rd., S.E.
Assistant Operator, good all-round.—Pyro, 45, Ladbroke-rd., W.

Employment Offered.

Spotters & Mounters, first-class.—Fradelle, Regent-st.
Enameller, at once.—Oeffelein and Co., 54, Berner's Street, London, W.
Retoucher, lady preferred.—Russell and Sons, Wimbledon.
Operator, Retoucher, Manager.—F. Benham, 7, Arcade, Landport.
Printer and Toner.—Messrs. Taylor, Manningham-lane, Bradford.
Assistant Operator at 25/-.—W. Mountain, 211, Clapham-rd., S.W.
Printer and Toner, good references.—Stiles, 8, Kensington-High-st., W.
Operator, Assistant, and Pupil.—B. K., *Photo. News* Office.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1315.—*June* 13, 1884.

CONTENTS.

DR. LOHSE'S ISOCHROMATIC PLATES PREPARED WITH TURMERIC EXTRACT.

As much interest now centres around the various methods of obtaining justly gradated negatives from highly-coloured originals, such as paintings, we are pleased to be able to lay before our readers the working details of Professor Lohse's method of treating gelatine plates with turmeric extract (see p. 327).

Dr. Lohse writes:—"The method of treating gelatine plates with turmeric extract, in order to make them sensitive to the yellow and the green, is as follows: Bruised turmeric root is extracted with alcohol, and of the strong alcoholic extract ten cubic centimetres are added to one hundred cubic centimetres of water containing ten per cent. of strong ammonia. In this fluid the gelatine plates are immersed for two minutes, and dried. Such plates when exposed to the solar spectrum do not give such a notable maximum in the yellow as is the case with eosine plates, but notwithstanding this, the sensitiveness for green and yellow is so far exalted that you are in a position to satisfactorily reproduce the whole spectrum from the yellow to the ultra violet."

In the above directions, Professor Lohse does not exactly specify the strength of the alcoholic extract which should be used, but we have found that a satisfactory preparation may be made in the following manner. Four ounces of turmeric root are thoroughly bruised so as to isolate all the larger fibres of the roots from one another, and the material is carefully packed into the funnel of the simple filtering or

percolating arrangement referred to by Captain Abney in his "Instruction;" but instead of using a cone of platinum foil, as one would when employing the apparatus for an ordinary filtration through a paper filter, a piece of fine platinum gauze was rolled up into a cone, and placed in the funnel as shown, in order to prevent the turmeric falling through into the receiving flask. Four fluid ounces of alcohol were now poured on the surface of the turmeric root, and after this had percolated through into the flask, another quantity of four ounces was similarly poured on, a third batch of four ounces being used in order to displace what alcoholic extract was retained by the porous root. When all had drained through that would come, the alcoholic extract in the receiver was found to measure almost exactly eight ounces; and if the packing of the turmeric root in the funnel is carefully performed, one may depend on the extraction of the bulk of the colouring matter; so the extract may be considered as representing about half its quantity of turmeric root. It was not found necessary to create a partial vacuum in the flask by connecting the outlet tube with an exhausting syringe; indeed, it would probably have been disadvantageous to have done this, as then sufficient time might not have been allowed for the thorough extraction of the colouring matter. It is, perhaps, scarcely necessary to say, that during the percolation of the alcohol the top of the funnel should be covered by a glass plate, as if this be not done, not only may a considerable amount of the alcohol be lost by evaporation, but the remainder is likely to be weakened by absorbtion of moisture from the atmosphere.

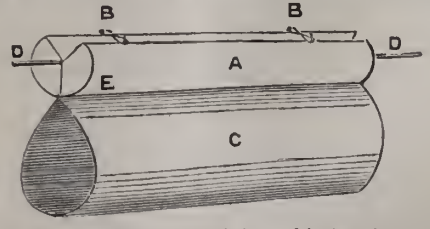
Anyone can try Dr. Lohse's method, and we shall be glad to be informed as to the result of such trials as our readers may make.

TO DRY ALBUMEN PAPER OR CARBON TISSUE WITHOUT CURLING.

MR. F. JAY HAYNES communicates to our contemporary, the *New York Photographic Times*, an account of an excellent idea which has struck him in connection with the drying of paper, his plan being to so clamp two edges of the sheet together that a kind of tube shall be formed with the coated surface outwards.

Mr. Haynes describes his clip arrangement in the following words:—

"A A, sectors cut out of a round piece of wood, working on a hinge-rod at its centre, as shown; B B, two



springs forcing the jaw, E, tight; this jaw holds the two edges of the paper as shown; C, albumen paper in process of drying; D D, rods for supporting the whole."

Excellent and useful as this arrangement may be for albumenized paper, it is the carbon printer and the user of Woodburytype tissue who will most highly appreciate the

importance of a simple apparatus for keeping the sensitive material in good condition while drying.

Although it is difficult to conceive a more easily constructed and more satisfactory clip apparatus than that figured above, it may be worth mentioning that something which will answer the same end may be extemporised by means of a couple of strips of printer's "reglet" and two or three American clips; but this would prove less satisfactory than Mr. Haynes' gripper, owing to the want of rigidity on the part of the jaws, and the inconvenience of having to loosen or remove several clips.

We would suggest that Mr. Haynes' apparatus might be improved by driving two studs or longish nails into the upper part of the sectors (near A, and at a corresponding part on the other side), as such studs or nails would be of assistance in opening the jaws.

THE AIR BRUSH—A PNEUMATIC RETOUCHING APPARATUS.

To Dr. Liesegang, of Düsseldorf, we are indebted for an opportunity of placing before our readers drawings of the latest form of retouching apparatus for producing stippled or crayon effects. The new apparatus is, in reality, an arrangement for breaking up any kind of liquid colour into a fine spray, and it is in principle quite analogous to the well known "perfume distributor," in which a stream of air is directed across the mouth of a tube delivering the liquid.

The air-brush apparatus, as manufactured by the Air-Brush Company, of Rockford, Illinois, U.S.A., consists of a kind of table with an adjustable desk, and near the

ground is fixed a bellows, which is actuated by the foot of the manipulator. The air passes from the bellows into a metallic drum, shown on the right-hand side of the apparatus, and from this drum it is led by an elastic tube into the spray-producing portion, or air-brush proper. Here it passes with considerable force through the blow-pipe shown at the lower and left-hand part of the small drawing, and in impinging against the tip of the pen-like ink ductor, it blows the liquid colour into the finest spray. The long lever, which is shown as projecting downwards, serves to regulate to a nicety the rate at which the ink spray is produced.

Any kind of liquid colour may be used with the air-brush, but Indian ink is the most convenient as a basis. If a photographic tone is desired, it can be made by

grinding alizarine lake and indigo water colours with the Indian ink.

That the air-brush will prove of great value for working up enlargements there can be but little doubt; but so perfect is the air adjustment that even small pictures can be retouched with advantage.

Not only can the shading and retouching of existing pictures be performed, but the air-brush may be used as a drawing apparatus for the direct production of pictures, either with or without the camera image as a guide. Let us suppose, for example, that the camera is used to project an enlarged image on a sheet of cardboard, and instead of making the enlargement by photographic agency, it is made in the dark-room by following over the image with the air-brush. Of course, an ordinary crayon can be used for making the sharp outline, if desired.

BLUE-INTENSIFICATION FOR GELATINE PLATES.

ANDERS, of Dresden, describes an intensification method which yields negatives having a blue or violet colour.

According to him, the fixed and well washed negative is treated with *his intensifying fluid*, and the image gradually becomes blue and vigorous, while the lights remain white; the half-tones come out well graduated, and, according to the length of time the plate is treated, one obtains any required degree of intensification. The method is available for under-exposed plates, as details previously invisible are brought out with distinctness.

If one wishes to transform the blue image into one having a deep violet tint, the plate is immersed in very weak ammonia (1 and 100 of water), and allowed to remain for some minutes.

The above *method*—if, indeed, one may apply the term to it—has been made the subject of a German patent; no further details having been published.

We can, however, see in this the essence of a mode of working which was described by Dr. Eder about eight years ago,* and it is interesting now to give some account of Dr. Eder's method. At the time referred to Dr. Eder wrote:—"A mixture of ferri-cyanide of potassium and a ferric salt acts in an analogous manner to the lead or uranium salts. If, however, one wishes to ensure the greatest regularity in action, the ferric sulphate should be used; and in this case the reaction takes place readily, and is quite similar to the lead intensification. The silver of the negative reacts so as to give rise to the precipitation of a deposit of Prussian blue, in consequence of which the negative becomes intensely blue. The following equation represents one phase of the reaction:—

$$\underset{\text{Ferricyanide of Potassium}}{2K_6Fe_2Cy_{12}} + \underset{\text{Silver}}{2Ag_2} =$$

$$\underset{\text{Ferrocyanide of Potassium}}{3K_4FeCy_6} + \underset{\text{Ferrocyanide of Silver}}{Ag_4FeCy_6}$$

The ferrocyanide of potassium, however, re-acts at the moment of its formation with the ferric salt, and gives rise to Prussian blue.

To make the blue intensifying liquid, Dr. Eder recom-

* *Photographischen Correspondenz*, 1876, p. 27.

mends that 6 parts of ferricyanide of potassium and 4 parts iron alum be dissolved in water; but it must be remembered that the fluid is very sensitive to light, and it is therefore necessary to keep it in the dark. A solution made up with ferric chloride instead of iron alum decomposes with tolerable rapidity even in the dark. If the negatives are imperfectly washed, they gradually become blue all over during the process of printing; and the intensified portions themselves become darker. The blue intensification is more delicate than mercury intensification, as the deep blue colour allows sufficient light to pass, to obviate the objectionable tendency to over-hardness.

By-the-Bye.

SMILES AND SMILING.

A REALLY beautiful smile, natural and without the taint of artifice, is one of the rarest as well as the most delightful inventions of nature. To smile is a joy reserved for mankind alone, for the hyæna does *not* laugh, whatever unscientific natural historians may say to the contrary. Not that we should like to assert too positively that all animals have not some equivalent method for displaying their emotions, for surely many of them show rudimentary attempts at expression in their faces.

Some dogs, for instance, can convey an easily interpreted expression of their feelings by their looks. The other morning we asked a friendly terrier, belonging to a neighbour, to go for a walk. There was a most distinct look of pleasure on that dog's face as he frisked around us when he accepted the invitation, and we fancied we could detect an upward curl of the mouth; there was certainly a twinkle in the eye. It happened that after we had walked a mile from home, we went into a shop, leaving the dog to wait outside. We stayed longer than we intended, and left by a different door to the one by which we entered, forgetting our canine friend. Since that time we have never been able to induce that dog to take any notice of us, except to put on a dejected, disgusted visage whenever we approach. His feelings were hurt, and he did not care to conceal it.

That rudimentary expressions are to be traced in animals goes to prove that the smile is the result of evolution, and that the perfected smile is a product of civilization.

The smile, then, being a product of civilization, is capable of being overdone and of becoming unnatural, as, indeed, is the tendency of all cultivated things; and it is this false smile that gives the conscientious photographer more trouble than any other phase of expression. The unconscious smile, that perfect expression of happiness, seems to be dying out. It is rarely present even in children, especially when they are in the hands of the photographer, however sympathetic he may be. Who amongst us does not constantly observe that painful nervous contraction of the lips and elongation of mouth seen in many children when they are being photographed? Parents and nurses are a good deal to blame for this. They impress on the young people, before they take them to the studio, that they must be still, and, above all, look pleasant. Now what is the effect of telling a child to be good? If it is of a kindly disposition, it will become prim; if the demon that seems to possess some children's souls has possession of it, it will become sullen. Then, being dressed specially for the occasion has its effect. It is impossible for a child used to the enjoyment, in easy fitting clothes, of the rollicking pleasures of the nursery, to appear at its ease in its "Sunday best," yet its natural guardians not only overdress the child, but will sometimes go even further, and try on unaccustomed garments and new ways of doing the hair. Now to dress a child in stiff clothes different from its ordinary wear, to alter the style of hair, and to solemnly impress upon the poor little mite that it must be good and smile, is to kill that child as a subject for the photographer. It is sometimes possible for a clever individual to make a modern young person forget all the world, and become "even as a little child" again, but the exertion is more than some photographers are equal to. So the natural smile is dying out, killed through the folly of mothers and nurses when they prepare their children for being photographed. We are glad we have been able to trace this growing defect of nature in its origin!

Mothers and nurses know so little of children! They are incredulous when told that infants never smile, but that it comes to them as they grow. The art of smiling has to be learnt by experience, and, perhaps, at that early age, infants have no happy thoughts to smile at. Mr. Darwin, who has gathered up so many facts in nature, describes his observations on this point in a characteristic passage:—"It is well known to those who have the charge of young infants, that it is difficult to feel sure when certain movements about their mouths are really expressive; that is, when they really smile. Hence I carefully watched my own infants. One of them, at the age of forty-five days, and being at the time in a happy frame of mind, smiled; that is, the corners of the mouth were retracted, and simultaneously the eyes became decidedly bright. I observed the same thing on the following day; but on the third day the child was not quite well, and there was no trace of a smile, and this renders it probable that the previous smiles were real. Eight days subsequently, and during the next succeeding week, it was remarkable how his eyes brightened whenever he smiled, and his nose became at the same time transversely wrinkled. This was now accompanied by a little bleating noise, which perhaps represented a laugh. At the age of 113 days these little noises, which were always made during expiration, assumed a slightly different character, and were more broken or interrupted, as in sobbing; and this was certainly incipient laughter."

In a second infant the first real smile was seen at about the same age, and in a third somewhat earlier. In this gradual acquirement, by infants, of the habit of laughing, we have a case analogous to other uses of the human frame. As practice is requisite with the ordinary movements of the body, such as walking, so it seems to be with laughing; it must grow, and if in its growth it is twisted out of form, it will never be a graceful and pleasant expression of joyous feeling.

The natural smile in children of a larger growth is interfered with by another cause. Young ladies seem to think that the glory of a woman does not lie, as of old time, in her long hair, so much as in her mouth. Modern ideas of beauty insist that the mouth must be small, therefore the owners of them must make them as small as possible. The facial efforts made to effect this purpose are prodigious. The lips are drawn in, and useless attempts are made to contract the lateral extension; while the desire to look cheerful, which naturally lengthens the mouth, fights with the antagonistic determination to keep within limits, and the result is an hysterical grin.

One of the most difficult features a photographer has to contend with is that form of mouth which has permanently-parted lips, leaving the teeth full in view. This is a defect that seems to be becoming more prevalent in this country. An inspection of a large collection of old photographic portraits will perhaps show that it did not exist to such an extent even twenty years ago. The effect is usually not disagreeable in nature. Momentary changes of expression seem to qualify the defect, if defect it can be called; but in a photograph, when the form is permanent, and has not the aid of varied movement, it is not agreeable, indeed, it gives the photographer much trouble, and taxes his ingenuity to hide it. This is a case in which any attempt at smiling is best avoided, as it only tends to make matters worse.

AN ELECTRIC RELEASE, APPLIED TO THE CENTRAL DROP-SHUTTER.

BY M. MAUDIT.*

THE object of this paper is to resolve the second part of the problem which I set myself when I had the honour to present an account of my pneumatic release; and to indicate in a practical manner how to render it possible to give the worker a free choice between an electric release on the one hand, and a pneumatic release on the other hand.

The arrangement (fig. 1.) is enclosed in a small cylinder

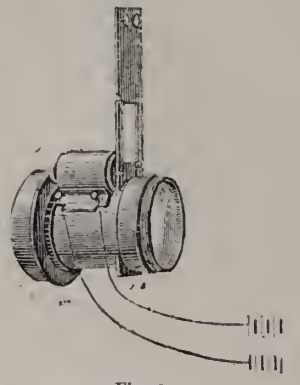


Fig. 1.

of soft iron, nickel-plated, and fixed upon the objective just in the same way as the piston actuated by air pressure. The cylinder, C, as may be gathered from an examination of the section shown by fig. 2, is merely an electro-magnet

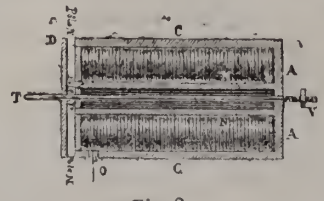


Fig. 2.

with concentric poles, exactly similar to that made use of by Mr. d'Arsonval in his ingenious telephone. One pole is in the middle of the helix, while the other occupies the whole of the circumference. The end plate, A A, is of course neutral. One terminal of the coil is soldered to the metal work at a point (between B and A), while the other extremity is attached to an insulated binding-screw, O. When a current is passed, the iron becomes magnetized, the central cone becoming north, and the extremity of the outer tube becoming south, or *vice versa*, according to the direction of the winding, and the angle at which the current enters.

The advantage of this electric magnet is the circumstance that it unites in a small volume the greatest of power, as the whole of the surface of the soft iron is subject to the maximum of magnetic influence.

Through the central rod or core of the electro-magnet there passes a stem of brass marked T on the diagram, care being taken that this rod can move quite freely. Near one extremity of this is attached a disc of soft iron, D, while the other end is furnished with a regulating-screw, which renders it easy to adjust the distance of the moveable disc from the magnetic poles.

When the magnetization of the iron takes place, a consequence of the passing of an electric current through the wire, the projecting end of the brass rod (which should previously have been so placed as to support the steel drop) is withdrawn, and the exposure takes place.

As a generater of electricity, I prefer to make use of the small sulphate of mercury battery which M. Ed. Loiseau makes for actuating his electrical ornaments. Its electromotive force is a volt and a half, while the circumstance that it remains in action for several days renders it suitable for photographic use.

* *Bulletin de la Societe Francaise de Photographie.*

IMPURITIES PRESENT IN PYROXYLINE.

BY DR. J. M. EDER.

PYROXYLINE invariably contains bye-products which vary much according to the raw materials from which it is made.

When pyroxyline is made from perfectly pure cotton-wool with the view of collodion making, it contains 1·3 to 5·6 per cent. of hygroscopic moisture, and about 0·1 per cent. of ash. In addition may be mentioned traces of nitric acid, sulphuric acid, and potassium salts (these latter if nitre has been used in the preparation) are present in recognizable quantities.

As regards the photographic relations of pyroxyline, however, the organic bye-products are of importance. The presence of such substances has been supposed by Hunt,* and to such he has erroneously attributed the rapidity of the wet collodion process.

Hardwich was the first who clearly enunciated the view that the sensitiveness and other peculiarities of wet collodion do not depend on the presence of organic bye-products, although these foreign bodies undoubtedly influence the photographic behaviour of the collodion. In 1859 he announced that the filtrate drawn off after pyroxyline has been precipitated with water contains a bitter substance which is always to be found in collodion pyroxyline. In the case of linen pyroxyline this body was present to a much larger extent than in the case of cotton pyroxyline; but when the linen pyroxyline had been allowed to remain in the acid mixture for a long time, or was prepared at a high temperature, the amount was considerable. The circumstance that pyroxyline undergoes rapid alteration when in negative collodion (as evidenced by the reddening of iodised collodion), and the great intensity and dark colour of the negatives, led him to suppose that such appearances depended on the presence of a greater or less proportion of the organic product. Hardwich considered this substance to be nitro-glucose, and he recommended its separate preparation and addition to the collodion in order to obtain increased intensity.

Mouckhoven accepted this view of Hardwich,† and it has been adopted in all the text-books.

The addition of nitro-glucose to bromide of silver emulsion has been tried, and indeed recommended by Gough, three or four drops of grape sugar syrup being added to the acid mixture used for nitrating 100 grammes of cotton-wool; by this means a pyroxyline either containing nitro-glucose or its decomposition products was obtained. De Pitteurs preferred to add nitro-glucose directly to the collodion which he used in making the emulsion. Notwithstanding this, the advantage of the addition is questionable.

The gum-like bye-product that is contained in pyroxyline, and which passes over into the collodion, appears, according to my experiments, not to be nitro-glucose. If collodion is precipitated with much water, and after boiling the liquid is filtered off, evaporated to a small volume, again filtered, and once more evaporated, a transparent yellowish-brown amorphous mass separates. This substance has a feebly acid reaction, also a slightly bitter taste, and I propose to call it "pyroxyline gum."

Pyroxyline gum yields a trace of pyroxyline to a mixture of alcohol and ether, but it is itself not very soluble in this fluid: it, however, communicates a yellow colour to the liquid. It does not re-dissolve perfectly in water, an indication that a portion has become decomposed during

* *Horn's Photographic Journal*, 1856, vol. vi., page 57.
† *Photo. Arch.*, 1862, vol. cxvi., p. 190.

the evaporation; and it is noteworthy that the aqueous extract, if evaporated again, yields a material which is not perfectly soluble in water. Dried at 100° C., pyroxyline gum becomes brittle and feels quite dry, but when exposed to the atmosphere for twelve hours it absorbs water and becomes pasty.

Pyroxyline-gum is, before its decomposition, soluble in a mixture of alcohol and ether, also in water; but not in benzole or chloroform. After being heated to 100° C., it loses solubility in the first-mentioned liquid.

Pyroxyline-gum consists of carbon, hydrogen, oxygen, and nitrogen (the latter being recognized by Dumas' method). The amount of nitrogen present amounts to 1·2 per cent.

As bye-products there are traces of nitric acid (recognizable by means of brucine) and sulphuric acid; and also traces of potassium salts when nitre is used in the preparation of the pyroxyline. The aqueous solution of pyroxyline-gum becomes gradually brown when exposed to sunlight, while ammonia dissolves it when heat is applied, forming a brown fluid, which reduces an ammoniacal solution of silver slowly in the cold, but rapidly if heat is applied. In a hot and concentrated solution of caustic potash it dissolves rapidly and completely to a yellow fluid, and from this hydrochloric acid throws down a very small quantity of a white flocculent precipitate which contains no nitrogen, while the acid solution contains nitric acid and nitrous acid. Warm nitric acid or concentrated sulphuric acid dissolves it; the latter solution showing the reaction of nitric acid when tested with sulphate of iron in the usual way.

Pyroxyline-gum also reduces Fehling's copper solution, and it has the property of liberating iodine from iodide of potassium; but it does not appreciably affect bromide of potassium.

The amount of pyroxyline-gum in pyroxyline varies according to the method of nitration and the purity of the cellulose; but, as a rule, it may be mentioned that my analysis leads me to conclude that from 1·25 to 1·83 per cent. remains in solution when the ether-alcoholic solution of the pyroxyline is precipitated by water. Of this about 0·91 or 1·60 becomes insoluble in water and a mixture of alcohol and ether during the evaporation, leaving about 0·21 or 0·35 as the amount of gummy residue.

If the cellulose is not pure, the proportion of gummy impurity becomes greater; and if, for example, a small proportion of gelatine is present, the yield of pyroxyline-gum is as high as 3·9 per cent.

OBSERVATIONS UPON FADING.

BY JOHN SPILLER, F.C.S.*

So much has been said and written upon this subject, that it might be thought almost superfluous to attempt to throw new light upon such a worn-out topic; but the supreme importance of the matter, coupled with the fact that discussion has been reopened by the reading of a paper on "Old Photographs," by Mr. E. Dunmore, at the March meeting of the South London Society, must be my justification for once more returning to the subject.

The conditions of permanence are tolerably well understood by photographers, and, so far as regards silver prints, much more care is taken at every stage of their production than was formerly the case. By the liberal use of fresh hyposulphite, and subsequent removal of the excess of fixing salt by very thorough washing in water; the employment of alkaline, or at least well neutralized gold toning baths; silver sensitizing bath, not too weak; negatives not too thin; all are points to which attention must be paid, and, so far as my inquiries lead, are now generally observed.

The photographer having done his best, is now unhappily at the mercy of the paper-maker, for he must needs mount his pictures in some sort of presentable form, and these perchance will find their way into portfolios or albums. What now, if after all the operator's care and trouble in the exclusion of every trace of hyposulphite from his finished print, he proceeds to mount it upon a cardboard impregnated with this very substance? Or if, careful himself about the card mount, his client thrusts it through the grooves of a mass of paper stuff in the shape of a common album, or puts it behind a heavy "cut mount" of doubtful constitution, with a view to its better preservation?

Sixteen years ago, I pointed attention to the "Occurence of Hyposulphite in Mounting Cards," in an article written for the PHOTOGRAPHIC NEWS, which this Society did me the honour to reproduce in the *Photographic Journal* for May, 1868 (Vol. XIII., p. 54). It was there shown that cardboard was seldom or never free from hyposulphite, and a mild appeal was made to paper manufacturers to abstain from using this salt as "antichlor." Now that the subject of fading is again to the front, it seems to me desirable to re-open this old question, and I have been testing cards and mounts, and making a heap of inquiries of the paper makers. My Report, briefly stated, is as follows:—Hyposulphite still to be found in cards of recent make, and the practice of using this salt as antichlor generally admitted by the English paper-makers.

Without mentioning names, I may say that the testimony is most conclusive as to its continued use; but I am not without hope that experiments now being tried on the large scale, on improved methods of manufacturing paper-pulp from wood, &c., by the bisulphite of magnesia process, will result in the introduction of a new system likely to be of considerable benefit to our craft. If this should succeed—and I hear favourable reports from several quarters—a revolution of manufacture will be brought about, and henceforth no antichlor necessary. At the recent Soirée of the Chemical Society (April 24th), Messrs. Cross and Bevan exhibited some samples of Ekmann's new paper-stuff, made by the disintegration of wood under great pressure, and boiling with the bisulphite solution; and these specimens certainly looked like the right article. On the same occasion, Messrs. A. Boake and Co., of Stratford, exhibited a large series of sulphites and bisulphites, as used by paper manufacturers. I am told that Ekmann's pulp can be mixed with an equal quantity of white rag pulp to make the finest paper, and that there is no necessity to employ hyposulphite. If this experience is confirmed, we are out of our difficulties. On the other hand, we know there has been of late a demand for extra thick mounting boards, which could only be supplied at a low or moderate cost by the use of very inferior materials, faced and backed with a better quality of paper. This, of course, offers no guarantee of permanence to the photographer, and the black or highly coloured tablets are often the worst of all.

Tracing the history of this "Antichlor" proceeding, I find, on reference to the English patents, that in the year 1852 (Nov. 26) Thomas Ainsley Cook filed a petition for "Improvements in Bleaching," described as follows:—"In all bleaching operations where chlorine is employed it becomes necessary to take up or neutralize any chlorine that may be in excess. Now, my invention consists in the use of any of the following salts:—Hyposulphite of lime, of soda, of ammonia, of potash, of magnesia, or of alumina, which I apply to the goods, after being treated with chlorine, when the hyposulphite used will neutralize any excess of chlorine that may remain in the material bleached."

Eighteen months later (A.D. 1854, May 9) Eben Norton Horsford took out a patent, No. 1,038, for "The Removal of Chlorine from Substances and Fabrics." This invention "consists in neutralizing chlorine by means of the substance called 'antichloride of lime,' which may be prepared by passing the fumes of burning sulphur into milk of lime, contained in a suitable vessel, provided with agitators. The antichloride of lime, being collected on filters, may be dried and preserved for use. It may be applied by adding a small quantity directly to the pulp engine; or fabrics out of the 'chemic' may be passed through water slightly acidulated, containing in suspension a little of the antichloride."

Here, then, it will be seen that sulphurous acid was proposed to be used instead of the hyposulphite. On tracing back, however, to the earliest mention of the use of sulphites in paper-making, I find a prior claim in favour of John Donkin (A.D. 1846, Oct. 15, No. 11,417); and, as I shall presently show, it is a true misfortune for us that at this early date the manufacture of bisulphite of soda was not sufficiently perfected to allow of its general use as an antichlor, or we should have been spared many of our troubles during the last thirty years. The specification runs thus:—"Improvements in the Manufacture of Paper, or in the machinary employed therein, and in the process of bleaching paper, linen, and other manufactures in which chloride of lime

* Read before the Photographic Society of Great Britain.

is employed." By disclaimer (dated 1847, March 22) the title of this patent is altered to "Improvements in the Manufacture of Paper, and in the process of bleaching linen and other manufactures in which chloride of lime is employed." This invention consists in "the application of bisulphite of soda in solution to paper, pulp, linen, and other articles or materials which have been bleached by means of chloride of lime, so as to decompose and get rid of the chloride of lime which may be remaining mixed therewith or attached thereto." In practice the patentee has found that "about a pound of the saturated solution of bisulpite of soda is sufficient for decomposing the chloride of lime in the pulp obtained from a hundredweight of rags, when the pulp has been well drained or pressed."

By all means, let the paper-stuff be well washed from the bleaching lime and other salts subsequently applied as antichlor, but in order to determine by actual experiment the relative effects of sodium sulphite and hyposulphite, if left inadvertently by the paper-maker, I took two photographs (silver prints), cut them in halves, and submitted them for equal periods of time to the action of these two solutions. The results (exhibited) show that sulphite of soda has no appreciable effect in 48 hours, whilst the other portions of the prints immersed in the hyposulphite are considerably bleached, or, as we should say, badly faded.

These striking differences are borne out again by another experiment which I then made. Clean a few sixpences or small silver coins, and put them into sulphite of soda solution, weak or strong, hot or cold, and leave them there for an hour. Pour off the top liquid, and test for silver by adding a drop of sulphide of ammonium. No trace will be found dissolved. Now try a similar experiment with the hyposulphite, using the same coins, and we shall soon find very distinct evidence of silver in the solution, showing that the metal has been attacked and dissolved by the combined action of air and hyposulphite, forming the well-known double salt of sweet taste.

With these facts before us, the fading of a silver photograph becomes perfectly intelligible, and the necessity for thorough washing, and careful exclusion of hyposulphite from the finished print, become at once apparent. I have described these results somewhat at length, because they furnish an answer to Mr. Dunmore's extraordinary statement, "fresh hyposulphite, even as strong as a 20 per cent. solution, applied to and left in the prints, and dried in the usual way, has no effect whatever on their permanence."*

Forced to indicate the cause of fading, the last-named author attributes the deleterious effects, wherever it arises from the mounts, to the presence of chlorine (excess of bleach) rather than to the hyposulphite. I have looked into this question also, and certainly find soluble chlorides in the cheaper sorts of cardboard, with plenty of sulphates and all kinds of mineral rubbish, but never met with *free chlorine* in the finished mounts. It would most likely be absorbed by the sizing, if traces only were left in the pulp.

Now, in the event of the paper-makers accepting the suggestion to use sulphite instead of hyposulphite, how would this affect the iodide of starch test, upon which we have been accustomed to rely for the detection of the last-named ingredient? It is known that sulphite of soda will also quickly discharge the blue colour of the starch compound. Thus far no difference. But we have a ready method of distinguishing between them, for the sulphite instantly discharges the colour of weak magenta, whilst the hyposulphite has no such action. This, then, ought to be the paper-maker's guide as to the quantity he should add to the bleached pulp— so much as will neutralize the chlorine, and yet not discharge the colour of highly-diluted magenta. Messrs. Giles and Shearer have gone fully into the testing of sulphites in a recent communication to the Society of Chemical Industry, which was printed in their last month's *Journal*. They worked upon some very pure samples of crystallized sulphite of soda made by Messrs. A. Boake and Co., on a large manufacturing scale, which tested over 99 per cent. This proves that high qualities are now procurable, which was not the case when Donkin took out his patent.

Mr. Valentine Blanchard, in speaking of "The Finished Photograph,"† says :—"In a conversation with Mr. England some little time ago on this subject [fading], we confirmed each other's experience that prints mounted on a lithographic tint were more permanent than prints on the ordinary board—the reason for this is not difficult to find. The thin layer of greasy ink keeps the photograph from contact with any deleterious matter in the board, and that such matter exists in a great many samples of pasteboards is only too well known to most of us."

The selection of tinted mounts in preference to pure white is always to be recommended, for then the paper-stuff need not be so highly bleached, and a further precaution is the final application to the photograph of an encaustic paste, which, by diminishing the hygroscopic qualities, helps to shut out the influence of moisture, always so detrimental to the permanence of a photograph exposed in our variable climate.

I have only to add that Dr. Hugo Müller informs me that in South Germany the makers have entirely given up the use of hyposulphite, and he says the same of North Britain. From another source, I learn that the paper-makers of Angoulême tried to do without it a few years ago, but have gone back to the old practice. Perhaps now the reduced cost will again offer encouragement to the use of sulphites ; if so, the photographic community will be well content to hear that a fertile cause of fading has been banished for ever.

* "PHOTOGRAPHIC NEWS," March 14th, p. 140.
† YEAR-BOOK OF PHOTOGRAPHY, 1884, page 77.

ILLUMINATION OF THE DARK-ROOM.

BY W. E. DEBENHAM.*

THE preservation of one of our most cherished faculties, that of sight, is of so much importance to our comfort and well-being, that it is proper to give full consideration to the question of how it may be affected by the light in which we work.

Mr. W. Ackland remarks that since the introduction of red light into photographic dark-rooms, he has observed a remarkable increase among photographers, more than others, of failing sight. On this ground he deprecates the use of red light, and recommends the employment of one of a cooler character.

Dr. G. A. Herschel writes :—"Unfortunately for the dark-room operator, red light of all colours is a great deal the most injurious." By those who advocate the use of red light in the dark-room, other reasons have been sought for to account for the photographer's special liability to failing sight. To some extent these reasons may co-exist with the evil influence of the red light.

There have even not been wanting those who say that they prefer a red to a yellow, or greenish light, as a matter of personal comfort ; but I am sure that the great majority feel the fatigue and irritation to the sight of working in red light, and would gladly change it for light of a cooler colour, if they were aware that the necessity for using a red light, which has been so insisted upon, is a mistake, and that yellow light, of the same degree of illuminating power, has no more effect upon the photographic plate, if as much, as the long vaunted ruby.

The question naturally arises,—How is it that, if there were no necessity for red light, it came with the introduction of gelatine bromide plates to be insisted upon, and almost universally adopted ? It was because it was said that bromide of silver was, compared with the wet plate collodion, the sensitive compound of which consisted mainly of iodide, much more sensitive to the yellow light in particular, and that red light must therefore be used for bromide, whereas yellow was proper for iodide manipulations.

It has often been stated that bromide of silver, whether in the form of collodion or of gelatine emulsion, is more sensitive to the colours of the middle and lower part of the spectrum, and will represent these as lighter, compared with blue and violet, than the old collodion bath plate, which ordinarily consisted of iodide of silver and a small proportion of bromide. So strong a hold had this idea upon the minds of photographers, that when collodion bromide emulsion came into use, although it was less sensitive as a whole than bath plates, it was said that it was so sensitive to yellow and orange light in particular, that it was necessary to use red light for the purpose of the dark-room, and plates were stated to be fogged in a laboratory, the light of which did not injure the bromo-iodide bath plate. This probably arose from the much longer time that bromide emulsion plates were exposed to whatever light was used, during their preparation and lengthened development, than was necessary with bath plates.

When rapid gelatine plates first came into common studio use it was during a winter season, and it was asserted that their

* Read before the Photographic Society of Great Britain.

rapidity was due to their greater sensitiveness to the yellow light of winter; and it was predicted that when the spring and summer came round, it would be found that they would be no more sensitive than the accustomed collodion. This was found to be a mistake, and the most careful experimenters could find no difference in the relative sensitiveness of the two processes in the winter and summer seasons.

Captain Abney, when recommending the use of a small portion of iodide of silver in bromide emulsion, stated that this addition so changed the range of sensitiveness of the compound, by lowering the sensitiveness to orange light, that plates containing a small quantity of iodide might be safely developed in such light, whilst those containing pure bromide only, and of equal general sensitiveness, were so sensitive to orange, that a red light only must be employed in the dark-room. Dr. Eder states recently, *Photographische Correspondenz*, April 1884, page 95, that the addition of iodide renders the plates more sensitive to the yellow and green. Considering that yellow and orange are so close together in the spectrum, and that the bulk of photographic action is at the other end in the blue and violet and beyond it these statements are almost exactly opposed to each other.

I have here a sheet of coloured ribbons, made up of violet, blue, green, yellow, orange, scarlet, and crimson; the colours, of course, are not as pure as those of the spectrum, but they are much purer and brighter, and should produce more difference of photographic effect than the colours of natural objects with which the photographer ordinarily has to deal, and in the delineation of which spectrum photography professes to direct him.

For photographing these, I have prepared three emulsions: No. 1 containing bromide only, No. 2 containing five per cent. of iodide, and No. 3 ten per cent. The emulsions were prepared in other respects in a similar manner, and were made by the boiling process.

Here are photographs produced by these emulsions, and I think you will not be able to find any difference between the results sufficient to be positively affirmed. In each case the violet has come out the strongest, and then the blue. From the green downwards, the colours have all come out in each plate of nearly equal depth, but it will be noticed that the yellow and orange have had less effect upon the plates than the reds. Probably some white may accompany the reds, although they were the purest colours I could obtain in ribbons; still the main point is that with each plates the result is about the same. From this we gather two things: first, that the addition of iodide does not make that difference in the range of sensibility to the colours presented to the camera that has been stated; and, secondly, that if we were to work in our dark-rooms by light reflected from these surfaces, we should choose the yellow and the orange, as having less effect upon the plate than the reds, and giving at the same time far more luminosity.

About a year ago, Mr. J. A. Sawyer showed a somewhat similar sheet of coloured ribbons and photographs from them, in which it was remarked that each colour came out lighter or darker than another in precisely the same series, whether the negative had been taken on an ordinary bath plate, consisting of iodide and a small quantity of bromide, or of a gelatino plate containing bromide and a small quantity of iodide. There was not, however, among Mr. Sawyer's experiments one with a plate containing bromide only; and it is to compare this with plates also containing iodide, and to examine the alleged effects of this addition, that these experiments are made.

At one of the Technical Meetings of this Society I brought forward a lantern, the four sides of which were glazed with different materials, the two most contrasted of which were two thicknesses of ruby glass in the one case, and in the other a yellow produced by two thicknesses of yellow paper and one of a yellowish-green glass. The latter combination was considered by all those present to give a much better, as well as a more agreeable, light to work by than the rubies, and at the same time it had been found to produce at a given distance much less upon a sensitive plate.

Captain Abney, at the March Ordinary Meeting of the Society, followed with a paper, in which he spoke of the questions, which he had considered settled, as having been re-opened, and without referring specifically to the particular light that I had compared, maintained that red was better than yellow for the purpose of dark-room illumination, selecting, as the types for comparisons, a glass known as stained red, and a yellow paper known as canary medium. Now the stained red glass has this peculiarity, that it appears a red, but is really formed by the piling up of yellow. It is a curious fact that, if a clear, transparent yellow is taken, and fresh thicknesses of the same added, the transmitted colour becomes orange, and, finally, to the eye, red, although, when examined with the spectroscope, it will be seen that the yellow still passes, and this adds to the luminous effect to the eye, although the existence of the colour is unperceived. Everyone who has used bichromate of potash solution must have noticed that a thin layer appears pure yellow, but a thick one orange; and, if very thick, red. Stained red is a silver stained glass, in which the quantity of silver is sufficient to give an orange-red appearance instead of the yellow which a thinner layer shows. I have here a wedge made up of increasing thicknesses of stained yellow, where it is seen the colour passes from a pale yellow to a reddish-orange. More thicknesses would show a colour identical with that of the stained red, except for the fact that the natural greenish tint of so much ordinary glass would have its effect. If a piece of stained red be broken, it will sometimes happen that it will chip a little so as to divide the layer of stain, when, as in this piece, it will be seen to be yellow. Immersion for a short time in hydrofluoric acid will, by dissolving away part of the layer, allow the characteristic yellow to be seen, as in the piece now handed round.

In the experiment described by Captain Abney in the March paper, there appears to have been an unaccountable oversight, which, when pointed out, will, I think, be admitted. The trial of illuminating power was made by light passing through rather small holes in the sides of a lantern. Now to find a reading distance with a clear medium like stained glass the opening in the lantern may be reduced until no larger than the flame, without affecting the result. With a diffusing substance like canary medium, the smaller the opening the more the light is cut off, and the nearer the observer has to come to it to see with equal distinctness. The trials for protective power should have therefore been made in a similar manner, at definite distances from the screens of the lantern. Instead of this, the glass and paper were laid upon a plate, and this exposed to the light of a candle flame; the conditions were therefore not comparative. It is, of course, obvious that when using a clear medium—the stained red—enlarging the area of the sides of the lantern would not have increased the illumination at any given spot—the book read from—but would have made a great difference to the diffusing medium—the yellow canary. Another, to me, unaccountable circumstance is, that Captain Abney should have found so much more protective power with the stained red glass than with the canary medium. I have examined several samples of the stained red, which, however, differed but very slightly, and find in each case that more photographic action passes than through canary medium. I have here a sort of negative, composed of three media side by side—a piece of stained red glass, a piece of canary medium, and one of ruby glass. Exposed either to lamp-light or daylight, the canary medium shows less image than the stained red, and the latter less than the ruby.

In addition to condemning the use of a yellow light, Captain Abney stated that the use of a green glass only stopped those rays that were comparatively harmless; and in an article, about the same time, in the *Bulletin Belge*, said that he thought the recommendation to use it proceeded from a confusion of ideas. Now, if a piece of green glass, such as I have here, be examined in the spectroscope, it will be seen that both ends of the spectrum are cut off, the blue is darkened, and the violet almost entirely cut off; the red rays are very much stopped, but the yellow passes pretty freely. When, therefore, such an accumulation of yellow medium is employed as to present a red appearance to the eye, the use of a green supplementary medium, by cutting off the red rays, restores the yellow character which, to most people certainly, is more agreeable and less irritating than red or orange, at the same time that it assists in more completely cutting rays off of some actinic power. In the lectures last delivered by Captain Abney before the Society of Arts, it was recommended, when additional safety was required, to supplement stained red glass by a sheet of cobalt. I have here a double lantern, in one compartment of which I will use a stained red and a cobalt, and in the other a stained red and a green. It will be seen that much more light passes through the stained red and green glasses than through the red and cobalt.

(To be continued.)

Notes.

Light for the dark-room still offers abundant matter for discussion, and Mr. J. R. Sawyer's suggestion that the source of light itself should be thoroughly screened from the eyes is an excellent one. Two years ago, in recommending the Swan electric lamp for dark-room use, we suggested suspending the lamp over the work, and using a piece of tinfoil so as to shade the eyes.

Certainly yellow light is now finding more favour than red light for use in developing gelatine plates, and as far back as 1880, Captain Abney (Bakerian Lecture) pointed out the conditions under which yellow light might be of especial service.

Martius' yellow, one of the nitro-derivatives of naphthol, appears to be one of the best yellow colours for protecting dark-room windows, and years ago we used it for collodion work. It is said to be the colouring matter used for tinting the so-called "golden fabric" that has recently been introduced into commerce, and of which Mr. Debenham spoke so highly at the meeting of the Photographic Society on Tuesday last.

Cloth or fabric possesses especial advantages of its own over paper or glass, as it is not likely to be fractured on one hand, or torn on the other. Moreover, by taking a piece of cloth and a few pins with you on a journey, there is but little difficulty in extemporising a dark room in almost any situation.

"But no experiments have been made with a view of proving it," was depreciatingly said on Tuesday by Mr. Peck, in reference to the supposed injury to the eyesight resulting from dark-room work. Long ago Mr. Woodbury told our readers how he had suffered; but the idea of experimentally investigating the matter is original. Who is to be the martyr to science?

Last week a hope was expressed that the Council of the Photographic Society would appoint a committee to deal with the whole question of impure haloid salts, and we understand that some steps have already been taken. No better guarantee for good work can be offered than the co-operation of such men as Abney, Davis, Donkin, Spiller, and Warnerke.

An incident which we noticed during a performance of Gounod's *Redemption* at the Trocadero one day last week illustrates the carelessness with which optical instruments are often handled.

A lady, whose face was covered with one of the spotted red veils so much worn in Paris just now, evidently derived but little or no advantage from the use of her opera glass, one by Arthur Chevalier, and it was almost painful to see her repeated attempts to remove imaginary dirt by probing at the lenses with the butt-end of her fan.

Not that photographers use their objectives after that fashion, but very few obtain on the sensitive plate the maximum of dividing power of which the instrument is capable. Unsteady stands, glasses screwed up too tightly, tarnished or corroded surfaces, and slides out of register are ordinarily of far more moment than the optical imperfection of the lens.

A good proof of the occasional phosphorescence of the diamond was afforded by a trial recently made by M. Picard, with an exceptionally clear and fine stone of 92 carats. It shone in the dark for more than twenty minutes after having been exposed to sunlight.

A photographic portrait is said to have enabled the Prussian Police to arrest Degaieff, who, it will be remembered, assasinated Colonel Sudeikin.

Photographing colours is a main question of the day, and in the *Bulletin Belge*, Captain Abney once more calls attention to the fact that the addition of Prussian blue to gelatine emulsion makes it more sensitive to the yellow than the blue; or, to put the matter more clearly, the sensitiveness to the blue is diminished below the yellow. Abney has found but little or no advantage in using isochromatic plates for landscape work, and he attributes this to the fact that almost all coloured bodies reflect very much white light.

Mr. David Gill, F.R.S., astronomer at the Cape of Good Hope, in a recent lecture at the Royal Institution, held out hopes that Mr. Norman Lockyer's idea of a complete photographic map of the heavens would shortly be attempted in a practical form. Dr. Elkin, an American astronomer, had expressed his willingness to do it in the Northern hemisphere, and Mr. Gill wished to do it in the Northern hemisphere if the Lords of the Admiralty would supply the necessary apparatus. There is much virtue in an "if," and it would not, perhaps, be well to say much about this map until the Admiralty authorities have acceded to Mr. Gill's wishes. It is estimated that it would take ten years to make a complete photographic map of the heavens—not so long when we consider the length of time the ordnance map of England alone has occupied.

The competitions held every year in Paris and London by *coiffeurs*, in which the competitors manipulate the hair in view of the members, suggests a new form of photographic contest. Why should there not be competitions in the posing and lighting of the sitter—a prize to be given for the most artistic picture? Practical demonstrations of this kind—not, however, as competitions, but by artificial light—have already been instituted by the Photographic Association of America.

A good many daring things were done at the Shakespearian show at the Albert Hall, but the boldest individual, perhaps, was a gentleman who actually offered for sale, photographs of himself in his fancy costume!

When photographers change the specimens in their cases it is as well to see that no inscription remains referring to former exhibits. Through neglect of this precaution, a Clifton photographer has been exhibiting a case of cabinet portraits, described as "Bristol Clergy and Ministers," all of which, with one exception, are portraits of young ladies!

It now appears that the Artistic Copyright Bill is the outcome of the deliberations of the Law Amendment Society, assisted by the advice and co-operation of "authors, artists, publishers, and others," invited to their meetings to discuss it clause by clause. Photographers appear to have been left out in the cold, unless they are included among the "others." The Printsellers' Association subscribed £50 towards the expenses, as also did the Royal Academy, and subscriptions of smaller amounts were received from the lesser artistic societies. "The Bill," observes "a print seller" in a letter to the *Pall Mall Gazette*, "may be said to go before Parliament with the unanimous and hearty approval of all the art bodies in the three kingdoms." It is very consoling to know this. The title, however, might, in the interests of truth, be improved. It should be called a "Bill for the protection of artists, engravers, and publishers, and to prevent the dissemination of art at low prices by means of photography."

Those who are interested in knowing how the photographic portion of the Bill has grown to its present proportions will find that the story has been fully related in our pages. It all arose out of an action brought by the Stereoscopic Company against a photographer in the north of England. The Company photographed the Australian Cricketing Team of 1882, and the defendant copied the photograph. Hence the action. The contention of the defendant was that, although the Stereoscopic Company had their name on the photographs, they had not complied with the Act, as they had not registered the name of the author (that is, the operator) and his place of abode. Mr. Justice Field held that the defendant was right, and this decision was upheld by the Master of the Rolls. It became necessary to meet this objection, and the Bill, which stands for the second reading next Wednesday, has consequently been strictly and elaborately framed.

Direct copying processes, in which the original writing or drawing is used as a cliché, are largely used by engineers for multiplying plans and drawings; but the somewhat slow iron or cyanotype methods are generally used. Gelatino-bromide paper may be advantageously employed instead; as, at a recent meeting of the Amateur Society of New York, Mr. Beach made a copy of a drawing on thick card, and another of a letter by Captain Abney. The exposure was one of a few minutes to the light of an oil lamp.

For legal purposes one would think that direct copies of documents impressed on gelatino-bromide paper would prove of great value, especially as one "photographic clerk" could easily make fifty or sixty reproductions by gaslight in the course of an evening.

Seaweed certainly should have more than a passing interest to the photographer, as not only is it the main commercial source of iodine, but our readers will remember how successfully Mr. Paymaster Mitchel used seaweed (*agar-agar*) as a basis for a gelatine emulsion (1882, p. 67).

Mr. Edward Stanford, whose name is so intimately connected with the development of the seaweed industry, has communicated to the Society of Arts an important memoir on seaweed products. As regards photographic uses he recommends for trial the British species *gelideum corneum*; and of gelose, the product of this, he says:—"Gelose has eight times the gelatinizing power of isinglass, and the jelly keeps well, the others soon get mouldy. Gelose may be valuable in the arts as a substitute for gelatine, which it so much exceeds in gelatinizing power. I would specially suggest its use as a substitute for gelatine in the production of instantaneous photographs."

From the wording of Mr. Stanford's remark, we cannot help fancying that his views as to the way of making instantaneous photographs are vague; but we gather interesting information, further on, regarding seaweed paper, a product which is made in France from the *Zostera marina*. Seaweed jelly, like ordinary gelatine, becomes insoluble by the joint action of light and bichromates.

The lime-light explosion, which we recorded last week, has terminated fatally, one of the injured men having died. This is the second lime-light explosion which has been fatal within the past few months.

A photograph on the season-ticket as a mode of proving identity deserves to be more used than it is; but we can recall to mind cases in which the railway season ticket has done service for us as a passport. An innocent deception of similar character was practised by a contributor, who, after much effort, obtained authority to be present at the opening ceremony of the Turin Exhibition; but on presenting himself he found that only wearers of orders could enter. He calmly pinned the badge of the 'Cyclist Touring Club to the breast of his coat, and was immediately admitted to the presence of the King of Italy and his Queen.

By the resignation of Mr. Alderman Hadley, Mr. Alderman Nottage is next in succession to the Mayoralty—that is to say, if the Municipal Bill does not step in meanwhile.

The latest absurdity in fashion with the New York "dudes" is to have the portrait of some leading beauty delicately outlined on the forehead between the eyes. We are not told whether this picture is effected by means of photography. Any way, it suggests that a fashionable Strephon might, if he chose, have the portrait of his Delia transferred to his own skin, and so be able to boast literally that he wears the picture of his lady love next his heart!

Patent Intelligence.

Applications for Letters Patent.

8538. JEAN JOSEPH DESIRE HUTINET, Paris, France, Manufacturer, for "An improved preparation or compound for photographic purposes." Dated 3rd June, 1884.

8566. GEORGE WILSON MORGAN, Photographer, 5, Crimon Place, Aberdeen, Scotland, for "Mechanically shifting photographic scenery, called Multiplex Background Screen."—Dated 4th June, 1884.

8643. BENJAMIN JOSEPH EDWARDS, 6, the Grove, Hackney, Middlesex, Photographer, for "Improvements in coating photographic plates or paper with gelatine emulsion." (Complete Specification.)—Dated 5th June, 1884.

8721. WILLIAM SAMUEL ATWOOD, 1, Lime Tree Villas, Chase Side, Southgate, Middlesex, Photographer, and SAMUEL BENJAMIN GOSLIN, 27, Jewin Crescent, Cripplegate, London, Engineer, for "Improvements in photographic cameras."—Dated 7th June, 1884.

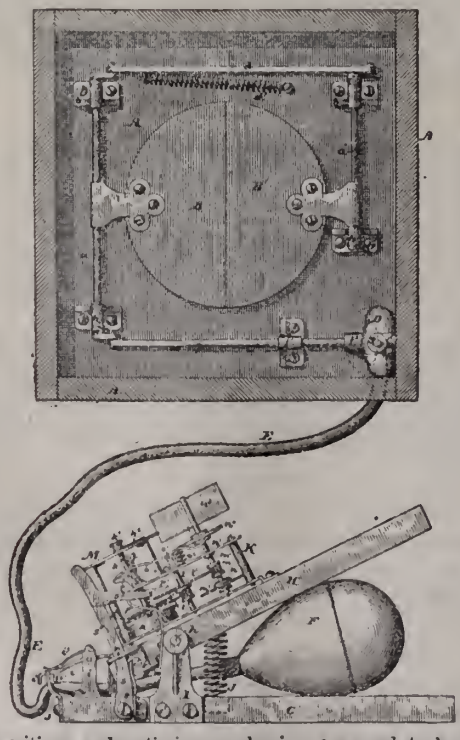
Patent Sealed.

5681. WILLIAM ROBERT LAKE, of the firm of Haseltine, Lake, and Co., Patent Agents, Southampton Buildings, London, for an invention of "Improvements in and relating to colour-printing, also partly applicable for producing coloured photographs and for similar purposes."—A communication to him from abroad by Auguste Bisson, of Paris, France, Heliographic Engraver.—Dated 8th December, 1883.

Patents Granted in America.

299,289. CHARLES W. STIFF, Foxborough, and NATHANIEL C. BOUSLEY, Salem, Mass. "Photographic camera." Filed Aug. 27, 1883. (No model.)

Claim.—1. In combination with a photographic camera, a mechanism to be worked by the operator, and arranged and adapted to open the lids or shutters of the lens-tube, a device for automatically locking and retaining said lids or shutters in their



open positions, and a timing mechanism arranged to be set in motion by the operation of the shutter-opening mechanism, and to release said locking device and permit the closing of said lids or shutters at the end of any predetermined interval of exposure.

2. A pneumatic device adapted to open the lids or shutters of a photographic camera, and at the same time set in motion a timing mechanism which will automatically close the same at the end of any predetermined interval of exposure.

3. A presser adapted to open the shutters of a photographic camera by forcing air into an expanding-chamber, to keep said shutters open by preventing the return of the air by any suitable mechanism, and at the same time to set in motion a mechanism that will automatically release the air from said chamber at the end of any predetermined interval of exposure, thus allowing the lids to close.

4. The combination of the lever H, pivoted to the frams G in any suitable way, the bracket r', with its slotted horizontal projection r, the spring-actuated lever s, provided with the notch s^2, the bulb F, the tube E, and the bulb D, in conjunction with a suitable mechanism for operating the lids or shutters of a photographic camera, substantially as and for the purposes specified.

5. The combination of the spring-actuated nipper-lever i', the forked bracket j, the spring-actuated hook j', all attached to the frame G, and the projection u, and plate x, secured to the shorter arm of the lever H, all adapted to operate substantially as and for the purposes described.

6. The combination of the presser G H, spring J, the projection r, the lever s, provided with the notch s^2, and bent arm s^3, and the arm w, attached securely to the shaft k of the clockwork, all adapted to operate substantially as and for the purposes described.

7. The combination of the dial M, the pointer k^6, the ratchet-wheel k^3, the pawl k^4, the gear k^5, and the spring k' all adapted to operate substantially as and for the purposes described.

8. The combination of the friction-disk n^2, mounted upon the shaft n' of the clock-work, the spring-actuated lever o, the bent lever p, and the bent stationary arm p', all adapted to operate substantially as and for the purposes described.

9. The combination of friction-disc n^2, mounted upon the shaft n' of the clock-work, the spring-actuated brake-lever o, the bent lever p, the spring-actuated dog q, the arm v, securely fastened to the shaft k, and means for operating the lever p, substantially as and for the purposes specified.

10. The combination of the lids or shutters B B', adapted to close the inner end of the lens-tube of a photographic camera, the shafts a a', the rocker-arms c c', the connecting-rod d, and means for operating the same, substantially as and for the purposes specified.

11. The combination of the lids or shutters B B', adapted to close the inner end of the lens-tube of a photographic camera, the shafts a a', the rocker-arms c c', the connecting-rod d, and the spring d', all substantially as and for the purposes described.

299,361. THADDEUS B. EIKER, Baltimore, Md. "Head-rest." Filed Sept. 19, 1883. (No model.)

Claim.—1. The combination, with a frame whose sides each consist of upper and lower folding sections, of arms for securing the device to the top edge of a seat, stops for supporting the upper sections of the sides, a transverse brace securing the sides together, and flexible covers, substantially as set forth.

2. The combination, with a folding frame whose sides each consist of sections pivoted together and formed with extensions and stops, substantially as described, of a transverse brace pivotally secured to the side sections, and transverse flexible strips or covering connecting said sections, substantially as set forth.

3. The combination of the sides of the folding frame each consisting of a lower section formed with a rearward extension and a stop, substantially as described, and a top section pivoted to the lower section, a transverse brace pivotally secured to the pivot of the side sections, and transverse flexible strips or coverings connecting the said top and lower sections, substantially as set forth.

4. The combination of the lower side sections, each formed with a rearward extension and a forwardly-projecting stop at its

top, the top sections pivotally secured to the lower sections below said stops and engaging the same, as set forth, the transverse brace, a transverse flexible removable strip or covering connecting the top sections, and a corresponding removable strip or covering connecting the lower sections, substantially as set forth.

FRENCH CORRESPONDENCE.

REPRODUCTION OF COLOURS—PHOTO-TRACING PROCESS—BALAGNY PELLICLE PAPER—M. MOLTENI'S IMPROVED LANTERN—PANORAMIC LENS COMPETITION—BALAGNY'S RED TONING FORMULA—GELATINO-CHLORIDE OF SILVER PLATES—CHAMBRE SYNDICALE.

Researches on the Reproduction of Colours.—It is very satisfactory to note the experiments just now being carried on in the reproduction of colours in their relative tones. Since MM. Tailfer and Clayton established in Paris a factory for isochromatic plates, a new impulse has been given in that direction. Ammoniacal eosine stands first among the substances added to the emulsion susceptible of diminishing the action of the blue and violet rays, and intensifying the yellow, green, and red. These experiments are interesting, as applications of photography to the correct reproduction of nature or works of art, and it is to be hoped that shortly we shall be able to take all colours in their respective values.

Photo-tracing Process.—At the last meeting of the Photographic Society of France, M. Davanne described a photo-tracing process as indicated by M. Cheysson, director of the map and plan department in the published works office. It is very simple in idea. A silver print on salted or albumenized paper printed from a negative, positive, or original design traced on paper, is taken, and the outline is gone over with a pencil, and the print submitted to a chloride bath for the purpose of transferring the image into chloride of silver. A bath of bichloride of copper answers the purpose satisfactorily; the photographic print disappears when immersed, the paper becoming white, while the outline traced remains visible. It is fixed in hypo or cyanide of potassium, and washed. The process is also applicable to tracings to be transferred to stone or zinc, only it is of no use to suppress the photographic image, and lithographic ink should be employed in the outline. I have always worked in this way myself with photographs to be printed in colours. From the tracing on the first stone as many prints are taken off as are wanted, so as to have copies on paper to be again brought on to stone or zinc in the process of chromo-lithography or chromo-typography. By destroying the image with bichloride of mercury, it can be made to reappear by using ammouia, or simply immersing in hyposulphite of soda, this being the process followed in the so-called "magic" photographs.

Balagny Pellicle Paper.—I have already pointed out some of the merits of this paper, used so successfully at the laboratory of the Museum of Decorative Arts, and I have conducted further experiments on outline subjects with it, and from its sharpness of definition find it suitable for making negatives for tracings on bitumen in zincography. It can be coated with wet collodion for impressions on bitumen. It shows no tendency to fog, and is sufficiently rich in bromide of silver, in spite of its thin substance, to give very opaque blacks in the shadows. These advantages combine to render it excellent both for objects with delicate gradations of shadow, and outline subjects, giving images in sharp black lines on a white ground.

M. Molteni's Improved Lantern.—M. Molteni, in presenting his new form of lantern for projecting and enlarging, has improved on his old model, so as to fulfil more fully the wants of photographers, and particularly the execution of enlargements from the small pictures taken by pocket apparatus. Among the characteristics of M. Molteni's lantern may be noted:—1st. The petroleum lamp, with a single flame, giving a steady light; 2nd. The reflecting mirror, placed at the back of the lamp, so that the rays converge on to the condenser placed in front of the light; 3rd. The lantern does not allow any diffused light to escape, so that it can be used without a conical guard. Of course, the same lantern serves equally well in projecting pictures on the screen, and, in such a case, a lens with full aperture should be used; while, for enlarging, it is best to use the same lens used for the original picture.

Report on the Panoramic Lens Competition.—The Photographic Society of France reported in December last on the competition for panoramic lenses. A prize of 2,000 francs was offered by the Minister of Public Instruction to the inventor of a lens fulfilling certain conditions. Unfortunately, but one competitor presented himself, without fulfilling all the requirements.

Balagny's Red Toning Formula.—The following is the formula employed successfully by M. Balagny for the red toning so much in vogue at present. Dissolve 1 gramme of chloride of gold in a litre of distilled water, then add 200 c.c. of a filtered solution, made at boiling point, of 30 grammes of borax and a litre of water. The toning bath is brought up to the temperature of 70° or 80° Centigrade, and then the prints are plunged into it for thirty or forty seconds only. They are afterwards fixed in hypo containing 1 to 2 per cent. of ammonia.

Gelatino-Chloride of Silver Plates.— Gelatino-chloride plates are now on sale by M. Hutinet for dia-positives. It is to be desired that this preparation should be more universally used for transparencies.

Conference organised by the Chambre Syndicale.—This conference is to bear on the all-important question, "The part taken by photography in the creation of works of art." Such is its title, and it is particularly directed to the attention of artists. It will take place on June 16th, and interesting communications will be made on the actual state of jusisprudence in the matter of photography.

LEON VIDAL.

Correspondence.

POTASH SODA SULPHITE DEVELOPER.

DEAR SIR,—In No. 1341 you gave us particulars of Mr. Newton's "Potash Soda Sulphite Developer," asking experimenters to advise you as to the result.

I find it to compare very favourably with "Alkaline Pyro" of the old form, giving a denser negative with more of the old wet plate characteristics, and takes a somewhat less exposure, but very much aggravates "blister and frill." I have tried it on four makes of plates, and consider it the best for amateur work, if judiciously used with the alum bath.—Yours truly, RICHARD PARR.

A PRINTING PROCESS FOR INDIA.

SIR,—I would strongly recommend your correspondent "Assam" (PHOTOGRAPHIC NEWS of 25th April) to stick to the silver printing process when travelling about in camp. The climate of Assam is warm and damp, and this will make both the carbon and platinotype processes very troublesome to manage. The collodio-chloride process might answer "Assam's" requirements, but the prepared paper would have to be procured from Europe, and it is doubtful whether it would keep. A printing process, simple, certain, and permanent, has yet to be discovered. —Yours faithfully, W. L. NOVERRE, Lt.-Col.

CHLORIDE OF CALCIUM FOR DRYING.—A CHEAP ARGENTOMETER.

DEAR SIR,—A few weeks since a letter appeared in your paper stating that the writer used chloride of calcium to dry photographic dry plates. I have made a number of drying boxes, but with indifferent success, dust, &c., being

a great enemy and a nuisance. I was going to try calcic chloride, but cannot obtain it here. A chemist told me that powdered quicklime would answer the same purpose, as they always used it for drying, &c. Will you be kind enough to say whether you think it would answer the purpose in an air-tight box? I am only an amateur, so that is my excuse for troubling you.

I have made an argentometer for the bath with one of those little bottles which are sold at the confectioners all ready filled with sweets. I removed the sweets, and loaded with a drop or two of mercury, after which I gummed inside a paper scale. Cost of it one-halfpenny. —Yours, GEO. W. PHILLIPS.

[Either chloride of calcium or quicklime may be used for drying, and although, as we have already pointed out, the latter may possess special advantages in some cases, chloride of calcium is to be preferred for gelatino-bromide plate work. An excellent plan is to obtain sheet iron baking dishes, and after having broken the chloride in fragments about the size of a marble, to well cover the bottom of each dish. These dishes being placed in the central part of any tolerably air-tight box or case, the plates are arranged on racks or otherwise round about the dishes. When the chloride of calcium has attracted much moisture, it can be restored to its original condition of usefulness by being baked till once more dry. Although the actual market value of chloride of calcium is trifling, it does not pay a retailer to sell it under about one shilling per pound unless there is a considerable demand. Doubtless our correspondent will find the local chemist willing to obtain some with the next consignment of goods he has from his wholesale druggist. If this should not be the case, it would be well to send a few shillings to a London dealer in photographic chemicals, and ask him to forward chloride of calcium to value.—ED. P.N.]

EXTREMELY SMALL DIAPHRAGMS.

SIR,—A question I have not seen touched upon in my reading is, What are the disadvantages and advantages of a very small diaphragm—smaller than one that is ordinarily used—say with portable symmetrical lens $\frac{f}{64}$? Supposing it were $\frac{f}{120}$, would its advantages in possible depth of focus compensate for the extra length of exposure on any subject?—Yours obediently, A. G. BROPHY.

[The point touched upon by our correspondent is one of considerable importance, and, as Captain Abney has had especial experience regarding this matter, and has also studied it theoretically, we hope he will say a few words on the subject in our issue of next week.—ED. P.N.]

THE PERMANENCY OF AURINE.

DEAR SIR,—In the paper read by me last Tuesday before the Photographic Society upon "Commercial Fabrics for Dark-room Illumination," and of which a report will doubtless appear in this journal, I recommended the use of aurine dissolved in varnish to give a very non-actinic colour to paper and fabric for use in lanterns and dark-room illumination generally. In the short discussion that ensued, Mr. Warnerke stated that he had found the aurine very fugitive in daylight.

I have had but little experience with it in daylight, and when it was introduced some years ago by Mr. Spiller, it was believed to be permanent under all conditions. Upon enquiry, I find that it is a permanent colour when used upon certain fabrics—silks and woollens, I believe—but not upon cotton goods; and, according to Mr. Warnerke, it is not a permanent colour upon paper. Be this as it may, it is perfectly stable, and very useful for all artificial light work; and as I employed my aurine locked up in the gums of a varnish, I am not disposed, without further trial, to abandon it for daylight work. I shall expose one of my aurine paper screens to the full daylight and sunlight for the next two months, partially shielded, and with your permission report progress in the pages of your journal.

I may mention that on receipt of a stamped and directed envelope, I will send a small sample of the yellow fabric and yellow paper that I recommend, and which in my hands form a perfect and safe screen for making or developing the most sensitive plates. The paper is treated with a drying varnish to give it transparency. J. R. SAWYER.

WELLINGTON AMATEUR PHOTOGRAPHIC SOCIETY.

SIR,—In your issue of the 1st February, I notice that you state that New Zealand has beaten Australia in forming the first photographic society at the Antipodes; and as you mention that the Auckland Society held its first meeting on November 2nd, 1883, this would lead to the impression that Auckland held first honours.

The Wellington Amateur Photographic Society was formed here in August, 1882, and I was under the impression that our late Hon. Sec. had informed you of the fact. Perhaps a few facts regarding our condition may not be uninteresting to you.

We at present number about twenty working members. A monthly meeting is held at the residence of our President, Dr. Hutchinson, of this city, at which work is compared and the usual photographic gossip indulged in. The photographic journals are also circulated amongst the members. Field excursions are held occasionally: our last one extended over three days, being held in the hilly district, about twenty miles from the town. Some of our members are continually making trips in various parts of the Colony. One of the members and myself have just returned from a six weeks' trip by sea to Auckland, returning overland, when we obtained about one hundred and eighty negatives.

From these remarks you may gather that amateur photography in Wellington is in a by no means unsatisfactory condition; and as we increase our numbers we hope for even better things in the future.—Yours faithfully,

W. WILLIAMS, Hon. Sec.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE last ordinary meeting of this Society for the present session was held on Tuesday, the 10th inst., at the Gallery, 5A, Pall Mall East, JAMES GLAISHER, Esq., F.R.S., President, in the chair.

The minutes of the previous meeting were read and confirmed, after which the following gentlemen were duly elected members of the Society:—Messrs. W. Von-Sommer, and S. G. B. Wollaston.

The CHAIRMAN said that on the last occasion the papers occupied a longer time than they were used to, so that Mr. Sawyer's paper, as also the discussion on Mr. Debenham's paper, was adjourned until the present meeting. It was proposed to take Mr. Sawyer's paper first, and the discussion on the two afterwards. He then called on Mr. Sawyer to read his paper on "Commercial Fabrics Suitable for Dark-Room Illumination."

Mr. J. R. SAWYER alluded to his friend Mr. W. S. Bird's remark at the March meeting, that "The great discrepancy between the scientific evidence, and the experience of skilled observers, indicates that something is wrong somewhere. May it not happen that our knowledge of the chemical effects of the spectrum is not so exact as it might be? When some observers are convinced that a light modified with yellow paper and a green glass will give the maximum of luminosity and the minimum of chemical action, it is bewildering to be assured that spectrum analysis demonstrates to the contrary. Futher enquiry is necessary to clear up the subject under discussion." "Yes," said Mr. Sawyer, "that is so, and for that reason I have been at some pains to bring the matter before you in a practical manner." He hoped to put the subject before them in such a way that they could give a verdict in favour of one kind or another; he intended steering clear of the spectrum, stained red, cathedral green, and canary medium. It had been said with great stress that red light was injurious to the sight—as much as

to imply that those people who are engaged in making, and those engaged in using, plates are always staring at the red light, instead of the work they have to do. In well arranged works this is not the case. When persons are reading they do not stare at the light, but at their book, and there is no reason why the same should not apply to the manipulations of dry plates. The strain put on the muscular fibres composing the ciliary muscles when the eye is quickly transferred from bright sunlight to semi-darkness was referred to, but with care to avoid overstraining the eye would accommodate itself to the changed conditions. Mr. Sawyer continued by saying that more than a year ago he read a paper before them on "Photographic Relation of Colour to the Eyes," and exhibited a series of bands of coloured ribbons, also photographs of the same; these he would again bring before their notice. No. 5, it will be remembered, was a more luminous colour than No. 7, yet it had a less actinic—that is, photographic—action on a bromo-iodide gelatine plate than the red. This fact indicated to him the direction for experiment. Taking the luminous values of red and yellow to be about the same, red is more trying to the eyes than yellow. The most suitable material he could find was book-binders' cloth, a substance obtainable anywhere; specimens of which, together with yellow paper, were handed round. By means of a suitable lamp, Mr. Sawyer showed the luminosity of the following media, also the amount of action on plates of known speed:—Ruby fabric, orange fabric, yellow fabric, ruby-orange, and yellow fabric; orange and yellow fabric, ruby and yellow, ruby and orange fabric; yellow fabric treated with aurine varnish; white paper treated with aurine varnish; the last two together also repeated with two thicknesses of aurine paper. The plates were of the same batch—*i.e.*, 24 on the Warnerke sensitometer. They were exposed, in all cases, the same time—five minutes at a distance of fifteen inches from the screen. Developing occupied four minutes with alkaline pyro, the maximum quantity of alkali being used; and to get the greatest possible fairness of results, they were all developed at the same time in the same dish. Mr. Sawyer then passed the results before the lamp, each plate being initialled with the particular kind of media employed. The results of the three first showed much action, the illumination being very good. The ruby-orange fabric showed a marked diminution in illumination, and likewise veiling. Orange and yellow fabric gave about the same amount of effect; but the illumination was better. Mr. Sawyer considered it proved, from those experiments, that a yellow medium had the advantage of diffusing more light than red with less effect, and less pain to the eyes. He could see that aurine, a substance which Mr. Spiller recommended some time ago, would prove better than any other substance for staining paper or fabric than he could procure. He therefore prepared both paper and fabric which gave him a colour somewhat approaching orange. Here is a single thickness of aurine paper, and it will be noticed that there is far less effect with it than any other of the mediums tried. It is dissolved in negative varnish, the proportions being 1 drachm of aurine in 1 ounce of varnish. It is soluble in water and alcohol. We next come to one thickness of paper and one of fabric, each treated with aurine. Beyond the plate being fogged, from forcing the development, there is no trace of decomposition—that is to say, there is no image. With two thicknesses of aurine paper and one of fabric, the light would be absolutely safe. Before quitting this part of the subject, he would recommend the mediums to be hinged. Two thicknesses of aurine paper and fabric should be sufficient for daylight if the major portion were covered with a black roller-blind until details appeared. His experience with greens was singular. He found ordinary light passed through dark green glass impressed a plate a good deal in five minutes; the same light passed through light green glass had no more effect, although the luminosity was much greater. He had tried several combinations of green and yellow, but would not bring them forward to night. They would agree that the experiments he had performed were fair and perfectly practical. With proper ventilation, and sufficient light from the proper direction, there is no reason why they should have any cause to attribute evil effects to dark-room work.

The CHAIRMAN: Before asking for a discussion, Mr Debenham has made an important improvement in his lamp which he will explain.

Mr. W. E. DEBENHAM: Since the last meeting I have made an improvement in the composite white light, making it, I believe, the safest light known, without intending to lead away from the conclusion that a general safe light is obtained with yellow medium. I have here three lamps; this one in which the light is turned down is merely used to give diffused light, of about the same relative power as the others used for the composite white light. One of these is glazed with green glass, the other fitted with deep silver stained glass (stained red) covered with pale green; light from this appears orange. Light from these lamps received on yellow paper is reflected through the front of the lantern covered with white tissue paper. Rapid (fifty times) plates exposed at reading distance (names in a directory were taken) for a quarter of an hour behind a transparency gave no image, but showed a slight mark where part of the transparency had been scraped away, leaving bare glass. Comparing this light with that produced by turning down the lamp low, reflecting from white cardboard, and transmitting through tissue, the second lamp appears more white than the first. The first is a little yellow looking. The lamp turned to such a height that reading distance was the same gave an image through a transparency in one minute. [The results were shown.] If in place of tissue in front of the double lantern, two thicknesses of Messrs. Law and Son's Golden Fabric be employed, the light appears yellowish; moreover one hour's exposure at a reading distance gives scarcely a perceptible trace where the transparency was scraped away. The same experiment has been tried with other very rapid commercial plates with a similar result. The sample of golden fabric was sent me, and I must say that it is the safest thing for the same degree of luminosity that has ever come under my notice.

Mr. C. RAY WOODS: At the last meeting I brought the results of some experiments, but owing to the lateness of the hour I was unable to show them; I will pass them round now. The plates were exposed through a negative made of one thickness of ruby and two of orange paper, something like Mr. Sawyer's; also through canary medium, orange and red glass, and dense ruby. Three thicknesses of canary medium transmit about as much light as two thicknesses of orange paper. The weak point in all fabrics is that so much of their safety is due to general absorption. From a piece of stained red glass a portion of the colour was removed, leaving the centre untouched; that central portion, when tested, had no effect on the plate. The stained red employed was a portion cut from a large sheet obtained at a glass merchant's in Kensington, and he (Mr. Woods) thought Mr. Debenham should have obtained the same kind of glass as Captain Abney had recommended before he (Mr. Debenham) made his experiments. Captain Abney had explained the difference between a stained red and a flashed ruby. Had Mr. Debenham used the same glass as that recommended by Captain Abney, he (Mr. Debenham) would have obtained similar results to Captain Abney. He (Mr. Woods) used a lamp for his experiments. Magnesium wire gave a different result; moreover, it is a light photographers are not used to. He never yet met a green which, when examined spectroscopically, would not permit the blue to pass. He considered he was justified in using the term cathedral green, as he found there was such a term used in the trade. In reference to Mr. Sawyer's paper, had he tried his media spectroscopically, it would have been better; the two results might be found to agree very well together.

Mr. J. CADETT had carried out some experiments with canary medium and stained red. He found the power of different observers to read in the two coloured lights varied. Of three observers, the difference in power of stained red was as 1·4 and 1·6. He considered bright red light had greater efficiency than yellow; when dealing with light of low power, then the yellow would be superior. It is surprising how much blue can be seen through canary medium by the spectroscope, only red and a little green being seen through the stained red glass. Yellow light would do for a packing room; but, for examining plates, the light should be stained red.

Mr. DEBENHAM said glass known as stained red is sold of two kinds, and they may resemble each other so closely as to deceive an experienced observer. Some red glasses are stained red on one side, yellow on the other, some red and orange flashed. Referring to the report of the last meeting in the *Photographic Journal*, he thought Mr. Cowan must have misunderstood him. The bundle of yellow plates passed round was not those used by him, they were merely to show that red is a compilation of yellow. In Mr. Sawyer's opening remarks, he referred to the scientific accuracy of the question. The best way is to get the distance by a scientific method, and try the photographic effect afterwards. In Mr. Sawyer's first experiments he showed very clearly the advantage of yellow over orange; the yellow was stated to give less effect. The distance should have been increased to get the

same luminosity or reading distance, then it would have been perfect. Aurine was not proved to be a better colour than yellow-green. Hinging the dark-room window was good; but he preferred the sliding form, as less in the way of bottles, &c. He did not think green alone had been suggested by anyone; the dark green shown was a blue-green; it should have been a yellowish-green. Mr. Woods is right in speaking of cathedral green as such, because it is possible to get cathedral in several colours; to speak of cathedral green as any particular colour is at least misleading.

Mr. L. WARNERKE found the best substitute for canary medium was chromate of lead, made by floating paper on a solution of nitrate of lead, then on bichromate of potash. Aurine and most of the dyes bleach considerably, so what might be good at first, soon becomes dangerous. Chromate of lead did not bleach like aurine.

Mr. SAWYER, replying, said everyone must define in his own mind what scientific evidence meant; but he did not mean his to be a scientific paper, only a practicable method of testing suitable screens in suitable lamps. Our dark-rooms are in a fixed position—windows, sinks, shelves, &c., remain in the same position. If we can have a yellow light fixed at two feet from the position of working, it must be preferable to a ruby light and working close to it. Although he did not trouble them with his experiments with the greens, he hoped Mr. Debenham did not think he had not gone into that part of the subject. Green takes from the illumination without any corresponding advantage. He was sorry Mr. Warnerke found aurine fugitive; if it was really fugitive, then lead chromate might be easily applied.

The CHAIRMAN, in asking for a vote of thanks to Messrs. Debenham and Sawyer, also to those who had taken part in the discussion, said that in all philosophical research the object is to increase our knowledge. With respect to glasses, no two pieces of glass are of the same intensity; it is a most difficult thing to obtain it when both are made at the same time. He felt thankful for the spectroscope, which proved so valuable; also thankful to Mr. Debenham, and to Mr. Sawyer. It would be a boon to have as much light in the dark-room as in the collodion days.

The vote having been accorded, the CHAIRMAN called on Mr. E. Dunmore to read his paper on "Silver Prints."

Mr. DUNMORE commenced by saying that the paramount importance of silver prints induced him to put a few notes together in the form of a paper. Permanency as applied to prints was a very elastic term, but with suitable precautions silver prints are to all intents and purposes permanent. Many of those produced in early days are as good as when first done. This being the case, there must be a reason for it. It is an axiom, that anything once done well, must have been owing to certain rules. Many years ago, Mr. Spiller introduced carbonate of ammonia in the fixing bath, and he at once adopted it, but he found it produced a white deposit on the prints. The question arises, What do silver prints consist of? First, we have the paper or foundation, which comes principally from a foreign market, and is the only portion which is beyond the control of the photographer. Coating this paper with albumen comes next. This is seldom done by the photographer, so is in a measure out of his control, but it essentially consists of coating the paper with a mixture of albumen, chloride of ammonia, and acetic acid. Stale albumen is well known to give a high gloss, and prints on paper albumenized in this way have been found to keep as well as on fresh albumen. Next comes the silver. His opinion was that the prints from a strong sensitizing bath are more permanent than those weak in silver. The action of light was next dealt with, and the change of silver chloride into silver sub-chloride pointed out, also the red substance which forms so important a part in the process of printing alluded to. The preservative effects of carbonated paper and their action during printing were pointed out. Weak light was said to produce an organic image; strong light a metallic image—the organic image being the one which fades. It matters little how carefully the prints may be prepared, they will be short-lived; but, on the other hand, if the metallic and organic images are properly combined, permanency would result. Toning was next dealt with. Here again a weak print consisted of too little silver to receive a good coating of gold before bleaching occurs. It is not necessary to carry toning so far to get permanency that bleaching should take place; it is better to stop the action before the reduction of the organic image occurs. Fixing should be freshly made, and the duration varies with the thickness of the coating of albumen. The functions of the fixing bath being performed, nothing remains but to well wash and dry the prints.

The CHAIRMAN thanked Mr. Dunmore for the capital manner in which he had put his thoughts together. Hitherto the organic and inorganic images have been too much mixed up: dull days and fine days give a very different looking coloured image. Regarding stale albumen, he (the Chairman) had a print hanging in the light for the last nine years which had been prepared on paper smelling very badly.

A vote of thanks having been accorded,

It was announced that the opening soirée will take place on Saturday, October 4th. All pictures for exhibition must be sent in by Thursday, Sept. 25th; no pictures can be received after that date. The judges will consist entirely of photographers, viz., the President, Messrs. Bedford, Donkin, England, Mayall, Mayland, and Pringle.

The next meeting will take place June 24th.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE last ordinary meeting of this Society for the present session was held on Thursday, the 5th inst., at the House of the Society of Arts, John Street, Adelphi, W.C., Mr. F. YORK, Vice-President, in the chair.

The minutes of the May meeting were read and confirmed.

The CHAIRMAN said the first duty he had to perform was one of a most melancholy nature; it was to announce that their old friend and highly-esteemed member, Mr. H. Baden Pritchard, had passed away from among them. He felt sure that it was the unanimous wish of all the members that a letter of sympathy be sent from the Society to the bereaved family.

A resolution to that effect was carried unanimously.

The date of the out-door meeting was next discussed, the CHAIRMAN remarking that as it was the desire of the Committee that their out-door gathering should be as popular as possible, they were open to discuss any suggestion from the members present. He believed Mr. Thorneycroft (who is an accomplished amateur) would place one of his steam yachts at their disposal, if a suitable time could be arranged; they might thus get an enjoyable day up the river.

The TREASURER mentioned that the date usually fixed was the last Saturday in July. It had been suggested in committee that they should ask the Photographic Club to join them. If they acted upon the Chairman's suggestion to have a steam launch, they could land when they pleased.

Mr. W. E. FOXLEE said the meeting at Hampstead last year was most successful, and he saw no reason why they should not go there again on the last Saturday in July.

After some further discussion, it was decided to communicate with Mr. Thorneycroft, the date of meeting to be subsequently announced.

The TREASURER read a letter from the son of the late President, the Rev. F. F. Statham, expressing, on behalf of the widow and family, their sincere thanks for the kind and compassionate letters they had received from members of this Society. They also felt deeply the kindly tribute paid to the deceased's memory by those members who were present at the funeral.

The CHAIRMAN, referring to the presentation prints, enquired if the subject should be selected by ballot from among the prints sent in for competition during the past year?

Mr. A. L. HENDERSON: If there is a good negative of the late President, I would suggest it be used for that purpose.

The TREASURER pointed out that they had already issued a presentation print of their late President, and still had several copies by them.

After some further discussion, a sub-committee, consisting of Messrs. F. York, W. K. Burton, and W. M. Ashman, was appointed to decide on a suitable subject, and report at the October meeting. It was also announced that the committee had decided to make the October meeting "special," for the purpose of considering the state of the Society, and making such alterations as may prove beneficial. A paper is promised for that meeting on "A New Lens," by Mr. Aekland.

The TREASURER hoped if any one had hints to give, or ideas stored up, they would please divulge them at the October meeting.

The following question from the question-box was read:—"What is the best developer for gelatine plates when copying for line work?"

Messrs. HENDERSON and BRIDGE spoke in favour of wet collodion for copying of any kind; but if an emulsion must be used, they would give preference to a very slow one.

Mr. A. COWAN advocated ferrous oxalate development, and said that with a suitable emulsion there should be no perceptible fogging or frilliug up of the fine lines.

Mr. W. K. BURTON recommended the questiouer to give plenty of exposure, then develop with plenty of pyro aud bromide, and use very little ammonia.

Mr. E. COCKING was able to bear out Mr. Burton's remarks. Reeently he had copied a good deal of line work, engravings, &c., and obtained good results by adopting the precautions just mentioned.

The CHAIRMAN said the great difficulty in developing with ammonia was the discolouration of the film, which it is not always possible to remove with alum and acid. With soda and potash he could develop for au hour for density, and get no discolouration which could not be easily removed.

Mr. FOXLEE thought the questioner meant which developer would give clear lines for photo-lithography, this being of more importance than density.

The CHAIRMAN had some difficulty in keeping down the density with the carbonate of soda developer. Replying to a member's question, he said he used twelve and a-half grains each of carbonate of soda, sulphide of soda, aud carbouate of potash, in each ounce of developer. It is necessary to put the plates in alum before fixing, which latter operation occupies a long time.

Mr. W. BROOKS found no difficulty in copying engravings with gelatine plates; he used ferrous oxalate developer, followed by inteusification with mercury, and afterwards ammonia.

Some silver prints seut by Messrs. Morgan aud Kidd were passed round; they were printed from paper negatives, made by exposing gelatiuo-bromide paper in the camera, and developing with alkaline pyro. The peculiar feature in these prints (some of which were of large size) was the abseuce of grain. The paper was not rendered translucent as in Calotype.

A vote of thanks to the Chairman having been passed, the meeting adjourned.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE usual weekly meeting was held on Thursday, the 5th inst., Mr. MACKIE occupying the chair.

Mr. H. STARNES exhibited his dark slide referred to at the previous meeting. It was of the usual shape, but made wholly of tin, the exhibitor claiming economy of space, less weight, and much less cost, in comparison with those made of wood. An extra piece of tin, with turned edges of same shape and length as the sides, but a trifle narrower in width, was soldered down the inside of each side, the space between the turned edges of the inner and outer sides allowing the two slides to be drawn out and closed freely. The plates were inserted into the slide with a sheet of thick black paper between them, through an opening in the top, and the opening being closed by a piece of wood covered with velvet fitting the aperture, an alternate portion of the projecting top of each slide being bent over this piece of wood, it was secured by either one of the slides while the other was pulled out.

Mr. DEBENHAM, referring to a paragraph read from a magazine on the washing of prints, remarked that prolonged washing weakened prints. He had noticed this with his Monday's prints that had been in water since the previous Saturday; the less time the prints were in the water (providing they were thoroughly washed), the more permanent they were likely to be.

The CHAIRMAN passed round a plate coated in 1875, by way of comparison with the plates of the present time (it was very thinly coated): also another plate coated from the same batch; this plate had been exposed and developed, receiving five seconds' exposure—the plate showed good density. The Chairman also drew attention to an *impromptu* dark-room lamp, made from a piece of "Golden fabric," simply rolled into acyliuder and pinned, the top being uncovered. A plate that had been developed at twelve inches from the lamp, a candle being used, was passed round; it was quite clear, without any trace of fog.

A question from the box was read, "Why does a very rapid plate take longer to develop when exposed with a drop-shutter in the open air, than the same plate given its relative exposure in the studio?"

Mr. HENDERSON said this was quite in accordance with his experience.

Mr. COWAN had found that plates exposed out of doors required different treatment to the same plates exposed in the studio.

Mr. W. E. DEBENHAM remarked that from the greater illumination of the shadows the contrast of an out-door picture was much less than one taken in the studio; apart from this, other causes, such as stroug reflections, a hazy atmosphere, &c., combine to influence, although not uecessarily, a plate exposed out of doors.

Some prints were sent by Messrs. Morgan and Kidd from paper negatives taken on their ordiuary gelatino-bromide paper. The negatives were not waxed, aud no grain was perceptible; this was attributable to the fact that waxing renders some portion of the paper more transparent than others.

Mr. COLE asked the relative exposure compared with glass negatives.

A member replied, about four times.

Mr. HENDERSON brought down his diffraction gratiug lamp, referred to at a previous meeting, for demonstration, Mr. A. COWAN supplying the plates for this purpose. The lamp consisted of a box with hinged lid, with the front taken out and the sides grooved, a trapped hole through the lid allowing the products of combustion to escape; the lid was raised to admit the lamp being placed iuside, or the re-arrangement of the media in the grooves. A portion of a plate was exposed under a sensitometer for teu minutes to the light passing through a diffraction gratiug and two sheets of auriue; and the other portion of the plate, exposed the same time and distauce to the same light, passed through for surfaces of plain glass made to appear of the same opalescence by rubbing with putty, and the same through two sheets of auriue. Upon development no deposit was found upon either portion of the plate. The lateness of the hour preventing a repetition of the experiment, it was understood that Mr. Heuderson would make a further demonstratiou at a future meeting.

Talk in the Studio.

PICTURE-MAKING BY PHOTOGRAPHY.—The following is extracted from a long and appreciative review of Mr. Robinson's recently published book, in the *New York Photographic Times*:—"When we received this, a new work by H. P. Robinson, we were at first strongly inclined to pen a few words of what we think would have been justly merited censure upon this well-known artist and art teacher, for having allowed his pen to remaiu for so many years in a state of apparent quiescence. But we recollected that if he has not been of late teaching or preaching, by precept, art as applied to photography, he has certainly been doing so by example, a fact of which the readers of the *Photographic Times* have been duly made aware. The reason why we attach importance to the teachings of Robinson is, because he possesses a trinity of qualifications: he is a good technical, practical photographer, and, in virtue of this, he takes technically perfect photographs; he is an artist, and therefore his photographs are works of art—by which we mean fine art, in contradistinction to technical art; lastly, he is not only well conversant with the canons of art, but he is a facile writer, and a master of the art of conveying his ideas to others in a manner capable of being understood."

MAKING "OLD MASTERS."—A well-known Paris picture dealer has published an interesting and useful pamphlet on "Sham Old Masters." He says that the commonest mode of counterfeiting an old picture is to cover a new one—painted, of course, for the purpose—with a certain transparent paste, which, when exposed to slight artificial heat, cracks and becomes brown. If a sufficiently venerable tint has not been produced, the canvas is washed with a mixture of lampblack and licorice juice. The picture is next exposed for some hours to the smoke of a wood fire, and the loose soot having been brushed away, is rubbed here and there with a rag which has been dipped in very dilute sulphuric acid. This operation gives a mouldy appearance to those parts which have been touched. The work is finely sprinkled by means of a tooth-brush aud a hair-pin with minute spots of a solution of sepia or gum-water, to imitate fly-specks, and it is then ready for the market. Signatures are imitated by experts who are known as monogrammists, and who devote their exclusive attention to such matters; and one of these men, who died recently and was known to the author of the pamphlet, confessed to the forgery of no fewer than 11,000 signatures of the Italian masters alone, and said that he had for years made a large income by the exercise of his art.

CHATTERTON.—A photographic likeness of Mr. Wilson Barrett, as the young Bristol poet who perished miserably in his poor

London lodging, has been taken by Mr. H. R. Barraud. The dawn stealing through the garret-window falls on the upper side of the face, leaving the lower part in shade.

THE SEASON FOR OUTDOOR WORK.—Members who go in for landscape work hardly need reminding that about now is the time for those delicate greens in foliage which are so difficult to pourtray by photography, yet are so pleasing when they are done. To a lover of nature, few sights are more pleasant than the blending of these delicate colours of early spring, and a few days spent in the country now go a long way towards counteracting the continual nervous strain produced by the noise of the increasing traffic of London streets.—*Journal of the Photographic Society.*

EXHIBITION OF INVENTIONS, 1885.—The first division of the Exhibition of Inventions, to be held at South Kensington in 1885, will comprise apparatus, appliances, processes, and products, invented or brought into use since 1862, and the second division will be devoted to musical instruments produced since 1860. His Royal Highness the Prince of Wales, the president, has nominated the following gentlemen to form the Executive Council:—Sir Frederick Bramwell, F.R.S., chairman; the Marquis of Hamilton, vice-chairman; Sir Frederick Abel, Mr. I. Lowthian Bell, Mr. Edward Birkbeck, M.P. (hon. treasurer), Sir Francis Bolton, Sir Philip Cunliffe-Owen (secretary) Professor Dewar, Mr. Joseph Dickenson, Sir B. T. Brandeth Gibbs, Sir George Grove, Mr. Edward W. Hamilton, Mr. Harry Jones, Mr. W. H. Preece, Sir Edward James Reed, M.P., Prof. W. Chandler Roberts, Mr. John Robinson, Mr. John Stainer, and Mr. Webster. Photographic appliances and processes will in all probability be well represented.

PHOTOGRAPHIC CLUB.—At the meeting on June 18th, the subject for discussion will be on "Printing-in Skies." Saturday afternoon outing will be held at Waddon. Train from London Bridge at 2.35, finish at Carshalton.

To Correspondents.

*** We cannot undertake to return rejected communications.

F. W. B.—1. A very wide margin is allowable, and an addition of an amount of bichromate equal to anything between one-twentieth of its weight and one-tenth will answer well. We should recommend you to dissolve the bichromate in the smallest quantity of water, and mix this solution with the melted size. Use the mixture before it sets. 2. A sheet iron dish (see page 379).

STUDENT.—You will find all you require in Robinson's "Picture Making by Photography," and also some valuable chapters on light, shade, and composition.

F. S. LYDDON.—You will doubtless find a list of them in the Post Office Directory, and you may also learn of some through the medium of our advertising columns.

R. PARR.—There are two forms, one for portraits and one for landscapes; but both are figured on page 295 of the present volume; still the advantages over the form you mention are very questionable indeed.

R. D. D.—1. All the information is to be found in Pritchard's "Studios of Europe;" both this and the work you mention being published at our office. The price of the former is 2s., and the latter 3s.

C. GILLMAN.—There is no silver whatever in the developing solutions, but a considerable proportion in the old fixing baths. Obtain some of the impure sulphide of potassium, known as liver of sulphur, and dissolve this in about five or six times it weight of water, after which add it to the old solutions until no further precipitation takes place. The precipitate is sulphide of silver, and it may be collected and sent to a refiner; or it may be reduced as directed on page 134.

HILLY.—1. Half a grain to the quantity mentioned will be quite enough, but the solution will work quite satisfactorily if you do not add any. 2. Quite strong enough unless in exceptional cases; also add twenty-five minims of glacial acetic acid, and thirty of alcohol. 3. It is very desirable to do so, but we have known cases in which excellent results have been obtained with the cheaper materials.

J. DUNCAN.—The weather is now very favourable, and you should select a locality where there is a long unobstructed view of the horizon.

RECRAM.—"Silver Printing, by Robinson and Abney," will answer your purpose.

M. J. H.—The sample of paper which you send is evidently made in the main from wood pulp, and moreover it contains a considerable proportion of hyposulphite of soda.

ENQUIRER.—It seems to us that one engaged as "assistant" should be prepared to do his best either as the former or the latter; but in ordinary cases the operator makes the negative, and the printer confines himself to his own branch of the work.

THOS. STOKOE.—We think your best plan would be to register each design as a "Photograph to be used for a border." Each must of course be specified separately, as, for example, "photograph of apple blossoms." You cannot take a patent for the process of bordering photographs as you propose; and, as far as we know, it is not possible to register the mere names as trade marks. It is impossible to in any way protect the mere idea, as it is not original.

G. BELL.—1. It is merely another form of the same substance, but when sold under the former name it is more likely to be of indifferent quality. 2. Carbonate of potassium is almost invariably present as an impurity in the product sold for pharmaceutical purposes. 3. What you require will be found in the present number. 4. A plain background is to be preferred in such a case, as you do not require a picture, but a mere diagram or exact representation. 5. You are mistaken: make enquiries of the last named person.

AMATEUR.—A solution of gelatine, if long kept in a heated condition, entirely loses its power of gelatinizing or setting when cooled, and it is converted into a substance known as metagelatine.

DOUBTFUL.—You will find that excellent results can be obtained on wet collodion, and as you are acquainted with this method, you had better make use of it for producing the first series, at any rate.

PYRO.—1. There is no advantage whatever in using fused nitrate of silver, as the sample you enclose is quite free from any excess of acid. 2. We have forwarded your letter as requested.

B. L. T.—It is well to blacken it inside, as otherwise any stray light might be reflected on the plates; black velvet makes an excellent lining.

T. T. OSBORNE.—Your picture is a good one, but you have mounted it so badly as to spoil it.

DELTA.—It merely consists of sulphide of calcium, but some physical condition, which is not understood, determines the properties to which you refer.

DILEMMA.—The print has not been allowed to remain in the hypo bath for a sufficient time to remove the whole of the chloride of silver. Do not forget that if the fixing solution is very cold, its solvent action is comparatively small, and that a notable degree of cold is produced when the salt is dissolved in water.

B. HUGHES.—You have certainly given ten times the necessary exposure, but probably much more than this—perhaps twenty.

W. A. F.—The addition of thirty drops of alcohol to each ounce will doubtless suffice to make it flow freely.

The Photographic News Registry.

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Reception Room and Retoucher.—A. B., 72, Azenby-sq., Peckham.
Operator or Gen. Assist.—F. W. Dodge, 12, Langlard's-st., Kilmarnock.
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Assistant Operator, good all-round.—Pyro, 45, Ladbroke-rd., W.
Operator, Retoucher &c.—E. P. W. Tayler, 47, Ferndale-rd., Clapham.
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Reception-Room, &c.—Miss Maunder, 6, Marlboro'-st., Paddington,
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Reception-Room, Mount, Spot.—R. E., *Photo. News* Office.
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The Photographic News.

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1346.—*June* 20, 1884.

CONTENTS.

EXTREMELY SMALL DIAPHRAGMS.

On another page of our issue we have an answer to the query of Mr. Brophy regarding the advisability of using a stop still smaller than the smallest which is usually supplied with an ordinary lens. The matter has been treated by Captain Abney in a theoretical manner, but it seems to us that the main issue is whether there would be any real practical gain in diminishing an aperture to as small an amount as $\frac{f}{120}$. Our correspondent has scarcely settled this point, for though he has shown that such a diminution of aperture is admissible, he has not stated that it is requisite. He has, however, pointed out that, in addition to depth of focus and flatness of field, a flatness of image would also probably arise. In the days of wet-plate photography it was a well-known fact that a small aperture to the lens was inducive of diminished pluck in the resulting negative, and hence most photographers essayed to use as large a stop as possible consistent with fair definition. The same, no doubt, applies to the present gelatine plates, though perhaps not in so marked a manner, since a gelatine negative is, as a general rule, with any stop, more delicate and much less vigorous than one produced by a wet plate. It would be well that a set of careful experiments should be undertaken to determine whether an increased exposure, when a small diaphragm is used, really means a diminution in the intensity of the image. Such experiments would give an answer in one respect to Mr. Brophy's query.

The diffraction phenomena which a small diaghragm $\frac{f}{120}$ would entail have seemingly no effect on the sharpness of image; though we would point that in the case of a negative taken with a view to enlarging, such a diminution might be hurtful. Supposing, for instance, that a negative were sharply focussed with a lens of 12-inch focus and an aperture $\frac{f}{40}$, the disc of confusion of the image of a point would be perhaps only $\frac{1}{400}$ of an inch. Were this the case the use of a diaphragm $\frac{f}{120}$ would be absolutely hurtful, as the disc of confusion would be, according to Captain Abney, about $\frac{1}{800}$ of an inch. This means that with the former a sharp enlargement could be made to four times linear that of the original, whilst with the latter the degree of enlargement with equal sharpness would only be about twice. It is evident that with every lens there is some smallness of aperture beyond which it is not desirable to go, the diffraction undoing, as it were, the sharpness of the focus which would be attained were this phenomenon non-existent. We trust that before long we may be in a position definitely to give this information.

We well recollect that the late Mr. Dallmeyer was horrified at the idea of making any stop smaller than $\frac{f}{50}$ or $\frac{f}{60}$, but we gathered that it was more an objection to the curves to which such a lens must have been ground that should require such a small stop, than to the fact that diffraction stepped in. There is no doubt that in a good lens the stops usually supplied are sufficient to give good definition under ordinary circumstances; with inferior lenses they certainly may not be. In such a case the use of a smaller diaphragm should be tried. The great drawback to its use is the increased exposure required; for instance, the smallest stop of one well-known lens of 12-inch focus has the smallest stop, in which the aperture is about $\frac{1}{3}$ of an inch, or $\frac{f}{36}$; by diminishing the aperture to $\frac{f}{120}$ the exposure would have to be increased about 11 times more than that required by the optician's smallest stop.

With a lens of 12-inch focal length $\frac{f}{120}$ means a hole of only $\frac{1}{10}$ of an inch in diameter, and we can scarcely imagine that under any circumstances would a lens require a stop smaller than this; and from the calculations to which we have referred, it seems that anything much smaller than this would really defeat the very object for which the diminished aperture was employed.

RED OR YELLOW LIGHT FOR THE DARK-ROOM

The battle of the red and yellow lights still rages, as is evident by the manner in which the discussion on the paper of Mr. W. E. Debenham, and that of Mr. Sawyer, was conducted at the last meeting of the Parent Society.

The principal subject has certainly been worn pretty threadbare; but, as is often the case when matters of the kind are discussed, there were brought forward some side issues, which are of no small interest.

Mr. Cadett called attention to a matter which may do much to account for the extraordinary discrepancies which have existed in the results got by different experimenters. Mr. Cadett's statement amounts to this—that the relation which exists between actinic power and illuminating power in coloured light is not the same for a strong light as for a weak light. To take the definite example which was given, it is, according to Mr. Cadett, the fact that, whereas if we are using a strong light, red will be safer than yellow; luminous powers being the same; if we are using a weak light, the yellow will be the better of the two. We have not ourselves put this matter to a practical test, but we can at least conceive the possibility of its being correct, and, as we have said, it would account for much that is otherwise somewhat inexplicable.

It will be seen that it follows, as a deduction from the statement just made, that yellow light is better for the *general* illumination of a room than is red, the less brightly-lighted parts of the room being in the yellow light quite visible; whilst with the red they are not. We think that most of our readers will agree with us that this is correct, and that, therefore, Mr. Cadett is right when he points out that yellow light is the better for certain operations in

connection with emulsion and plate-making matters; whilst red light is better for others. He took, as two typical examples, the packing room and the place where plates are singly examined for defects.

In the former case, a general and well-diffused light is most desirable, as the work will be spread somewhat over the room; in the latter case, all that is done is to hold each plate for a moment pretty near a comparatively strong light, no diffusion being necessary, or, indeed, even desirable. In the examination of plates with a view to the discovery of thinly-coated parts, it is almost necessary that the shape of a flame of some kind be visible. It is very difficult to judge either whether a plate is coated sufficiently thickly, or is coated evenly, by looking through it at a merely transiucent screen of any colour. When, however, on the other hand, we look through the plate at, for example, a gas flame with transparent glass intervening between the two, we can, by moving the plate about for a moment, tell at once whether it is properly coated; the outline of the flame visible through any portion being an indication of an insufficiently thick coating.

Mr. Cadett stigmatized a great portion of the talk which there has recently been about the use of the spectroscope as "silly," and we think he did this not without cause. It is absurd to say that because it is impossible to tell in all cases by the use of the spectrum alone, which of two colours may be the best for practical dark-room illumination, therefore the spectroscope is useless as an assistance in coming to a conclusion. A very good case in point was given. Canary medium, it appears, when examiued by the aid of the spectroscope, shows a considerable band of blue. Now this fact indicates to us the direction in which we should work to get a light much safer than that got by the use of canary medium. We have to search for some medium which will absorb this blue. Here the spectroscope has been of undoubted use; but it cannot be too emphatically understood that judgment of colours for illuminating the dark-room cannot be made by the spectroscope alone; it could, were there any portion of the visible spectrum which had absolutely no action on a gelatino-bromide film. Were this the case, we might follow the oft-repeated advice: "Get a safe coloured light, and use plenty of it."

Mr. Sawyer's experiments were very interesting, and would have been useful had any account been taken of the illuminating properties of the different coloured lights shown. As no such account was taken, we can hardly see that the demonstration will do much good. Various media were placed in front of a lamp, and the effect which the light filtered through them had on a gelatino-bromide plate was shown, the exposures being of the same duration, and made at the same distance from the light, in each case. A certain yellow paper which allowed a very large amount of illuminating rays to pass, gave a comparatively slight effect on the plate. A certain combination of, if we recollect rightly, orange paper and aurine varnished paper, gave no effect at all; and Mr. Sawyer concludes from this result that the latter is the safer medium. This we consider to be by no means proved by the experiment. Had the lamp been lowered in the case of the yellow paper so as to give as little illumination as is got when the aurine and orange papers were used, we believe there would have been made no developable impression. In fact, the matter was put rather neatly by a friend of ours, who remarked that by adopting Mr. Sawyer's line of reasoning, it would be easy to prove that a boiler plate made the best material for a dark-room window.

Mr. Debenham's "composite white light" has been much improved, and we should be by no means vastly surprised if it turned out to be a most useful light for practical purposes. It will be remembered that in its first form it consisted of two lights filtered, one through a red glass globe, the other through a green glass one, both being afterwards reflected from a white reflector on to a tissue paper diffuser. White light was the result, and this white light, although to all appearance the same as that got by reflecting the light of a candle from a white reflector, was found to be comparatively safe.

Mr. Debenham has now substituted for the white reflector of his composite lamp a light yellow one, and in front (or behind) the tissue paper diffuser has placed a sheet of "golden fabric" which is of a very light yellow colour.

It is curious that even when the light has been so treated, reflected from a yellow surface on to a yellow medium it looks as white as that got by reflecting the light from a lamp turned low, from a white reflector on to a white diffuser. It must, however, be borne in mind that the light got from a lamp turned low is in reality somewhat yellow.

It will be curious if, after all that has been written about the necessity for using the deepest ruby-coloured light, we eventually come to work gelatine plates by white light.

A METHOD OF REDUCING AND UTILIZING BROMIDE OF SILVER RESIDUES.

M. SCOLA communicates to the *Bulletin* of the French Photographic Society an easy method of reducing waste bromide of silver to the metallic state, and not only obtaining the bromine in a useful form, but also generating an electric current at the same time.

To separate the bromide of silver from the waste emulsion, M. Scola recommends that two or three per cent. of sulphuric acid should be added, and the mixture should be boiled for some minutes, after which the bromide settles rapidly to the bottom of the vessel. It is now washed and dried, when it is ready to be cast into sticks for use in the battery about to be described.

The battery in which the reduction is effected is constructed on precisely the same principles as the chloride of silver battery of Warren de la Rue, and one form of this, as is well known, consists of a rod of amalgamated zinc immersed in acidulated water, and opposed to a similar rod of fused chloride of silver, a platinum wire being embedded in this latter to serve as a conducting terminal. When the plates of the battery are connected by a conducting circuit, the chloride of silver becomes reduced to the condition of metallic silver, while the chlorine unites with some of the zinc to form chloride of zinc.

If the negative plate of the battery is made of fused bromide of silver, reduction takes place quite readily when the terminals are united, and when the battery is exhausted it is merely necessary to fuse the resulting spongy silver in order to obtain it in a convenient condition for use in making a fresh supply of nitrate, while the whole of the bromine takes the form of bromide of zinc, and remains in solution.

GLASS.*

NINTH ARTICLE.

Flattening.—The cylinders of glass as left by the blowers may be carried by boys (and in Belgium by very young girls) into the shed or house wherein is built the flattening kilns. Before being taken in hand by the flattener, the cylinders must first be split, which operation is performed by a man whose special duty it is to examine the cylinders, and by means of a diamond on the end of a long handle to cut each one inside lengthways. The split or cut does not open appreciably until the cylinder becomes hot in the flattening furnace. Before being introduced into this furnace, each cylinder is cleaned by the assistant to the flattener, who carefully deposits a cylinder into a short

* Reference to previous articles, vol. xxvi., pages 675 and 737; vol. xxvii., pages 3, 93, 226, 419, and 757; vol. xxviii., page 338.

passage leading into the furnace, where it becomes warmed. When ready, the flattener introduces a long iron rod into the cylinder, and dexterously lifts it into the hottest part of his furnace, wherein is a large slab of stone covered with a sheet of glass; on this the flattener deposits the cylinder. Soon the heat begins to tell upon the form of the cyliuder, which begins to lose its shape, and would threaten to collapse but that the flattener has his eye on it, and (the split being upwards) he, by neat touches with his iron rod, causes it to open out U-shaped, and then the heat soon brings the sides down flat. The flattener then takes another iron rod with a block of wood on the end, about the size of two columns of the PHOTOGRAPHIC NEWS; this is called the "polissoir," and with it he rubs down all the cockles and waves, and renders each sheet thus fairly flat. The stone is mounted on wheels, whereby it can be pushed away from the hot part of the furnace, when the sheet of glass is slid off the flattening stone on to the cooling stone, and then on to the small iron trucks which traverse the annealing kiln. And so the process goes on until each truck has received about a dozen sheets, when it is pushed ou, and an empty truck takes its place. Thus the truck first filled can be pushed out to the taking-off end of the annealing kiln in a very few hours. The glass is then still pretty warm, but for all practical purposes it is found that this annealing is sufficient. The glass as taken off the trucks is ready to be carried to the warehouse for cutting up or packing.

It would occupy too much space to figure and describe here minutely, flattening kilns. There are several styles in vogue, some heated by gas, others by coal or coke. Sufficient will doubtless be gathered from the foregoing description to convey to the mind of the reader that the manufacture of sheet glass is by no means a perfect process theoretically considered. Being blown in cylinders, the internal diameter must of necessity be less than its external diameter; there are no means applicable to obtain perfect parallelism of the sides of the cylinder, nor yet of uniformity of substance throughout the material. Notwithstanding, a fair approach to theoretical perfection is attained up to the point where blowing ceases; it is where the "spreading" or "flattening" commences that the really unscientific comes in as a sort of makeshift process. In the now almost obsolete article termed "crown glass," which was made in discs as large as an ordinary cart-wheel, the surface was not touched unless it was desired to be afterwards flattened, when it became "flatted crown," and therefore the original surface was much more perfect than glass blown into cylinders, which are finally spread out into planes. "Crown glass," however, unless "flatted," is always curved, every square, in fact, having the appearance of being part of a huge sphere or circle; this curvature is fatal to its use in photography, and unless it be "flatted"—when it becomes much enhanced in price—it is commonly superseded by sheet glass. Sheet glass, with its admitted defects—cockles, waves, strings, knots, sand-holes, dust, scratches, and burnt and sulphured surfaces—is so very cheap that it is difficult to see how any other article can be produced to compete with it. A theoretically perfect glass is at present only attainable at a high price, which in these days of cheapness must restrict its use.

In the flattening process through which sheet glass has to go, there is no doubt that its theoretical perfection is diminished by half; however well the cylinder may be blown, the flattened sheet has almost invariably some blemish or defect cast upon it by the flattening. This is regretable, but at present appears to be unavoidable. Whenever a theoretically perfect flattening process is invented, then we may look for a degree of excellence approached now only by the article known as patent plate.

The method of flattening described in the foregoing is that adopted in principle in all works; it may vary in details of form of the furnace, and arrangements for taking off the glass when it is flat, and in some works the annealing takes place in a kiln in which the sheets are "piled" or stacked on edge, not laid flat on moving iron trucks. Yet, whatever be the practice, the principle is to unfold a cylinder and spread it out flat, in the very doing of which it must be evident that the innermost surface of the cylinder must be *extended*, while the outer surface becomes *compressed*; in other words, a partial re-arrangement of the atoms must take place, which the softening heat of the flattening furnace is supposed to permit, and the subsequent gradual cooling—technically called *letting back*—of the annealing kiln is expected to adjust.

Since the introduction of the gelatino-bromide process there has been a considerable increase in the consumption of sheet-glass for making dry plates. Gelatine plates are now exported to every country on the face of the globe, but it is to be regretted that so much bad glass is used for the purpose, such inferior qualities as would not have been tolerated during the collodion era. Who is there that is not unhappily familiar with plates coated on wavy or wedgy glass supporting films presenting the most exasperating variations of density in the finished negative?

On dit, of late the complaints have been so numerous that already some of the makers have seriously considered the advisability of issuing their plates upon better glass, and we think it by no means improbable that very shortly photographers will awake to the advantages to be derived from the use of the very best descriptions of glass, even patent plate, especially so wherever the size of their plates is such as to make it self-evident that the loss of a valuable negative due to bad glass may entail a money loss equal to the difference in price between that of a gross of plates on bad glass and the same on patent plate.

By-the-Bye.

THE STRONGER WILL.

A YOUNG LADY in faultless attire, of graceful figure, rich in beauty, full of animation and affable withal,—how is the picture to be taken?

Turn her to the right, then to the left, to a demi-semi-three-quarter, as you were, and again an arrangement of one arm, followed by a cautious but bewildering anxiety for the whereabout of the other one, a turn of a hand, a turn back again, a twist of a finger——Ah! what is this? A sudden and overpowering sense of responsibility consequent on the dawn of recollection that in life she possesses two hands—and very pretty ones—and only one is visible. Just the slightest inclination of the head towards the instrument. Now look to the lens—no, no, the wall—and 'tis done. Not quite! 'Tis all gone!

The poor girl has simply been worried; her flow of spirits, the interest she felt in the coming picture, even her desire to be photographed, have fled, and in place of a volatile little damsel, full of effect in the hands of an artist, nothing remains but a languid, listless, tired-out subject. No more use this day, try as you will; only one more unfortunate to swell the ranks of those who "hate being photographed—it is such a bother!"

Take the case of another young lady, rather more matured this time. We have often met her; middle—well, say middle age, short of stature, rosy in complexion, rather asthmatical, and always carries an elaborate pocket handkerchief in her well-jewelled hand; a pillar pattern chain adorns her neck, which is set off by a genuine point-lace collar; and her brooch is an elaborate harmony in amethyst and gold. Of course her dress is black silk—she never has worn anything else since she was quite a child, and equally she will not, at her time of life, change her attire to suit anyone's notions. Well, she enters the atelier absolutely bursting with importance, and full to over-flowing with directions, which she rapidly proceeds to discharge point-blank in the photographer's face almost before he has had

time to realise the arrival of a new sitter. And you will be very careful to notice that one of her eyes is not the same size as the other, and that it has what ill-natured folks say is a cast; and you will notice one side of her face is fuller than the other—she is such a martyr to neuralgia; her mouth is a little askew, and her nose a little more so. She does not wish to sit down because she is—well, some people are so fond of saying she is inclined to be stout, and she does not wish to stand, because her figure—you see she is not quite so young as she used to be, and could she be taken leaning? She would prefer not holding a book, because it makes the hands look large; and she would rather not have a basket of flowers, because everybody else has a basket of flowers; and she decidedly and positively refuses to have anything to do with a fan, because she utterly objects to fans in any shape.

Now this is a fair sample of what may be termed "difficult sitters"—the best sitters of all when skilfully treated, and the class most enjoyable to the true artist. All these complaints are only so much human nature, nothing more. All these people require, is guidance. They must feel, and at once, they are in the presence of a stronger will, a stronger intelligence, and a superior brain power to their own, and they immediately become among the most docile, the most easily pleased of the photographer's *clientèle*.

Here we have the irrepressible baby, only six months old, and such a wonderfully forward child for his age; he nearly talks; he is the first increase in the family, and, as a consequence, is duly accompanied by an imposing processional of his father, proudly conscious of his own nothingness, and bearing a gorgeous Jack-in-the-box, wherewith to attract his attention at the auspicious moment; his mother, radiant in smiles, preparing the way for nurse, slow, but sure of foot, who follows with the darling, clad in vesture of dazzling whiteness. An aunt comes next, and her duty is simply to see that all doors and windows are shut, and that the little treasure does not sit in a draught; and a cousin, carrying toys and a powder-puff, brings up the rear. "You see, we could not trust a strange powder-puff, in case of anything, you know. And mamma would prefer baby taken alone in the largest of arm-chairs, so that he should not knock his dear little head, and the lowest of seats, for fear he should fall and break his divine little neck; and she would prefer it when she is holding out her arms to him, and papa lets go the Jack-in-the-box, and calls 'Ba-bee!' in that funny tone of voice of his, while nurse shows his bottle, and Sissy runs along the room to him crying out 'Bo peep!'" A marvellous arrangement, certainly; but as babies are, photographically speaking, exceptional, the *stronger will* must dispense with aids, and rely on its own powers.

Take the case of the gentleman of clerical mien, who insists on a position in the act of addressing a multitude—the arm is extended from habit. This gentleman, from his position, is accustomed to be obeyed, and at first he seems unable to realize it is *he* who has to render obedience to a man, but to a man the possessor of a master-mind to his own. In the studio all men are *not* equal; all men are inferior, for the time, to the artist; but, unless he would awe, he must conceal this power by tact and affability. Extempore speakers on any subject are readily found, men and women of fashion abound, but it is a work of time and much difficulty to alight on men who can stamp an individuality on every portrait taken. It is this individuality which is the result of genius, which brings to view an inception of the brain; and it is this individuality which must be the aim and the ambition of the photographer. Let him never rest content till of him it be remarked—not by accessory, not by background, not by stereotyped pose, but by *intellect* in the resulting picture—"That is a work by So-and-So."

Granted that pose is of paramount importance, the primary object is to hide this importance as much as possible; to convey the idea to the sitter that nothing unusual is about to take place; that the whole affair is a most ordinary transaction, not in the least differing from a customary drawing-room attitude, and the thing is done. But, to be effectual, a pre-conceived idea, which must be quickly acted upon, is essential; and the moment minute details are elaborated, altered, or emphasized, from that moment all is over. If the power to compose quickly and correctly do not exist, cultivate that power by study, cultivate it by reading, by drawing from, by reflection on, the works of the masters. And, let it be remembered, our sitters, in the majority of cases, take our measure as rapidly as we take theirs. The true artist works in a quietly assured way which begets immediate confidence; one feels safe in his hands, for the eye is calm, and there is no striving for effect. He evidently has a purpose, and that purpose is just carried through, and there is an end of the matter.

ALTERING THE DENSITY OF GELATINE NEGATIVES.

BY W. COLES.*

OUR subject this evening is "Altering the Density of Gelatine Negatives." Some there are who say they scarcely ever require to do this, but it may, I think, be taken for granted that, notwithstanding improvement in the quality of plates, and better illumination of the dark-room than formerly, it is still advisable frequently to slightly modify the density of the image after fixing if the best results are wished for.

What constitutes *proper printing density*, I shall not attempt to define. No two photographers taken at random would be certain to agree on that point, and I shall content myself with alluding to the means whereby we may secure the end without taking upon myself to set up a standard for you.

Inasmuch, however, as *lowering* rather than *increasing* the opacity is the easier (if colour and permanence are to be taken account of), it is preferable to make sure of sufficient density to start with, and reduce if necessary, than to stop development too soon and have to intensify.

Reduction of density may be obtained in several ways, and the following remarks will apply pretty equally to negatives or positives (with perhaps the omission of lantern slides), and, excepting the action of acid, to results obtained by pyro or oxalate development.

Negatives may be uniformly too dense, or have the high lights too thick and the half-tones thin; or there may be excess of detail with, at the same time, too great general opacity. The treatment of the negative must depend, therefore, on the existing gradation.

We will consider first the case in which a thin layer of the deposit may be removed from the whole film without injuriously affecting the gradation. On most pyro-developed negatives, acid will produce a change of colour dependent on the amount of yellowness present, and the strength of acid or time of immersion in it.

This may be usefully taken advantage of, where only a slight reduction is required, by employing a weak acid (5 per cent. will do), and removing and washing the plate as soon as the action has gone far enough.

Owing to the tendency of acid alone to produce frilling, it is customary to dilute it with a strong alum solution instead of water.

The weakening effect of acid not being always sufficient, it is desirable to be able to have recourse to other means. These may be: attacking the image only, or removing a thin layer from the film itself. Hypochlorite of calcium (chloride of lime), hypochlorites of the other alkalies, or of zinc, and ozone bleach, have a solvent action on the gelatine, and will remove a thin skin from the negative, carrying with it, of course, the silver contained in that portion of the film so dissolved. I have used this method both successfully and otherwise, but do not recommend it. It was very well till we knew of a better. Gelatines are not equally acted on, the softer kinds yielding too freely. The harder sorts are more tractable, but if hardened still more by alum, the softening of the gelatine is likely to proceed but slowly, and then all at once the film commences to come away rapidly, so that great care is necessary to ensure a uniform and certain result. If a heavy stream of water is allowed to fall upon the plate when

* Read before the London and Provincial Photographic Association.

it is desired to arrest the action by washing off the bleach, the film sometimes gets carried away more in one part than another, and even in holding up the negative to watch the progress of the operation, there is a liability to have the film drip off in little rivulets, giving streaky marks. A fine spray from a rose should be used for washing. Ozone bleach may be diluted with about 6 or 8 parts of water. A saturated solution of chloride of lime should he diluted with 12 parts of water.

The methods of acting on the silver alone are many. The metal itself may he dissolved away by cyanide of potassium, or a portion may be converted into chloride (or bromide), and dissolved out hy hypo or cyanide. For this purpose ozone bleach with chrome alum has been recommended and employed, but it possesses no advantages over other chemicals more agreeable to use.

Some metals, such as copper, iron, aud gold, form two kinds of chlorides (and hromides), one containing more chlorine than the other; and when the one with the larger quantity of haloid (that is, the cupric, ferric, or auric chloride) is brought into contact with silver, it gives up a portion of its chloriue to the silver, being itself converted into cuprous, ferrous, or aurous chloride. According to the extent to which this proceeds, the image becomes changed into chloride, and therefore soluble when placed in the fixing solution. An alteration in colour is produced without dissolving out the chloride of silver, hut this would probably darken if left in the film, so should he removed. It is desirable to wash thoroughly hefore commencing to reduce, in order to prevent stains.

Chloride of copper or cupric chloride is, of the three, perhaps the hest to use. Gold is expensive. Iron is, I fancy, more likely to give a yellow colour to the negative than copper. Five grains of ferric chloride to one ounce of water is a good strength. A few drops of hydrochloric acid in addition has been recommended. It may, if preferred, he mixed with the alum solution. If any pyro stain exists, it should first be removed with acid. The solution can be used until it gets weak, and then strengthened or thrown away. Ferric oxalate, as you are aware, is also used. Its action is similar to that of the chloride. Captain Abney drew attention some two or three years ago to the fact that its presence in old oxalate developer was a cause of thin images, the metallic silver being attacked as soon as formed.

Cupric chloride is a very nice reducer, easy and clean to use. I have employed it for some time, and find a suitable strength to be: copper sulphate 4 grains, sodium chloride 6 grains, water 1 ounce. The stock solution may, if preferred, be made more concentrated and diluted for use. If a good quantity is kept in the dilute state it can be used over and over again for some time without getting weak. When it is thought that the silver has been sufficiently acted on, the negative is washed and flowed over with, or placed in, clean hypo. If not reduced enough, after washing the operation should be repeated. The cuprous chloride formed is not readily soluble in water, but is easily washed out if the plate is dipped into weak acid and alum after the hypo has been removed. As the cuprous salt while in the film has a slight brownish tinge, its removal lowers the density a trifle more, and a little allowance should be made for this. With practice there is no difficulty in obtainiug any required reduction. Should the solution by any chance be used too strong, or, from unequal wetting of the plate with it, the negative be more affected in one part than another, the plate should be left in till the image is hleached right through, and then, after treating with acid and washing, he re-developed, again washed, and the reducing begun again. If washing between each operation is not pretty thorough, stains will probably make their appearance.

I now call your attention to an exceedingly easy, clean, and practical method, to which publicity was given by Mr. Howard Farmer in the Year-Book for 1884.

The reducing agent is ferridcyanide of potassium, and as this can be mixed with hypo, and will remain clear for some time, we have the very decided advantage of only requiring one solution instead of two. The slight uncertainty which always exists where reducing consists of two operations, is here removed. I had been experimenting a little in this direction last year, but on the appearance of Mr. Farmer's article found some one else had forestalled me.

Mr. Spiller's modification of the chloride of copper process, published in the Year-Book at the same time, was an attempt to do away with the use of hypo by employing a saturated solution of common salt along with the chloride of copper. In my hands the strength of cupric chloride recommended by him is too great for the operation to be well under control, and the action of the sodium chloride does not seem to keep up with the copper, so that the image gets couverted into chloride of silver faster than the sodium chloride will dissolve it out. Possibly an alteration of the proportions might give satisfactory results. The ferricyanide of potassium I prefer to use rather stronger than suggested by Mr. Farmer, viz., about 3 grains to 1 ounce of a 5 per cent. solution of hypo; it must be used fresh. The negative is allowed to remain in this till sufficiently reduced, then well washed. As there is then a slight yellowish tinge imparted to the film, the plate may he dipped in acid and alum after previously washing it. The ease and certainty of this process will commend it to all who try it.

The douhle oxalate of iron and potassium found in old oxalate developer has been recommended when dissolved in water with hypo. This, it is said, will keep. As it does not appear to possess any advantages over the process just named, and as those who do not use oxalate developer fiud it easier to obtain the ferridcyanide (red prussiate of potash) than this double salt, I have not thought it necessary to do more than allude to it.

Cyanide of potassium alone will act on the silver, hut not quickly, and I think on the finer details most. I am speaking now of a solution applied to the plate. Mr. Henderson has told us that it may he hetter employed hy exposing the plate face downwards to the fumes arising from a strong solution. One of the conditions of success is tbat the film must bc thoroughly wet right through, so as to be soft and easily permeated hy the fumes; and that the surface of the negative should be wiped free from drops of water, otherwise the reduction will not take place uniformly.

If the details are attended to, any amount of reduction can be obtained, as the negative passed round shows. The strength of the cyanide was about one in six; distance of the plate from the liquid perhaps $\frac{3}{4}$ to $\frac{1}{2}$ inch. At the end of fifteen minutes no change observable; in three-quarters of an hour, some reduction; in one and a quarter hour, a considerable lowering of density had resulted. Still it does not come up to the ferridcyanide of potassium and hypo method. The time required is too long for auyone to stand hy and watch it, and if the dish is placed on one side there is always the possihility of forgetting it till the action has gone just a little too far, whereas Mr. Farmer's process is quick or slow according to the strength of the solutions, and quite under control. It is therefore equally applicable to large or small plates. In using the plain cyanide it is advisable to lift the plate up frequently, as, if the air charged with cyanide fumes remains stationary for loug, irregular markings might be produced.

Local Reduction of Density.—When the dense part is of a fair size, a good way is to flow over first with a weak solution of the chemical employed, and then to pour on and off a stronger solution, letting the liquid impinge on the place where most reduction is needed. When, however, the too intense portion is of small dimensions, as in the case of a hand or finger, it is better to partially dry the negative, so that the liquid shall not readily spread, and apply with a brush, keeping the outline sharp. A better way still is to paint carefully with a tough varnish round the part to be reduced, and when it has hardened, to brush over with the reducing agent. Unfortunately, ordinary spirit varnish has a tendency to split up when wetted with water, so that there is danger of the chemical finding its way through the cracks, and producing markings where not wanted. For this reason I think a thin asphalt or turpentine varnish is the most suitahle to use. After the plate has been washed and dried, the surface should be cleaned hy ruhbing with spirit or turpentine, and varnished in the ordinary way.

Selective Reduction.—Thinning the shadows more than the high lights, or *vice versa*. The building up of the image in development commences at the surface, and proceeds gradually down through the film; the silver forming the detail in the half-tones and shadows therefore lies pretty much on the surface. As in most reducing processes an even layer of silver is attacked, it follows that the shadows lose proportionately more than their share, so that there is rarely any occasion to act specially on them. It may happen, however, in case of a much over-exposed and over-developed negative, that it would he improved by a little thinning down in chiefly the shadows; such a negative would, perhaps, he best treated hy reducing it altogether, which would of course leave the shadows barer, and then intensifying what was left of the image.

At a meeting of this Society some time last autumn, at

which I was not present, I saw by the report that a discussion took place on abrading the film with hard powder rubbed on with the finger or a stump. If any present have tried this method, perhaps they will give us the benefit of their experience. Cigar ash appears to me best suited for the purpose. I have tried it on waste negatives, but without sufficient success to warrant me in using it on a negative of any value.

Intensification of Negatives.—On this subject I have less to say than on the preceding one. When it can be seen while developing that the image is showing on the back of the plate before the details are out, a more brilliant print will be obtained if the developer is washed off as soon as sufficient detail appears, and intensification resorted to, than if it is attempted to get printing density by allowing the plate to soak till it has acquired enough pyro stain to make it dense. Granted that a negative is to be strengthened, the question arises what shall be used. There are in the market some preparations, the composition of which has not been made public; these I shall say nothing about. If a very little additional density is needed it will suffice, after fixing, to dip the plate in fresh hypo solution containing about five or ten per cent. of ferrous sulphate; this is rather of the nature of a stain than a deposit on the silver already forming the image, so does not impart much brilliancy, but is, nevertheless, useful at times when the negative is merely thin, but not over-exposed. Where more than a slight increase of intensity is required we must resort to other methods, of which we have several to choose from. The principal qualities desired are permanence, a suitable colour for retouching, and ease of application. Unfortunately these do not always go together. The first—that is, permanence—is nearly always wanted for any kind of work; the second is immaterial for general landscape and architectural purposes, copying, &c., but for portraiture a good colour is very important.

Silver Intensification has always been recommended. The chief condition necessary to success is, that all hypo should be thoroughly removed from the film. It does not, however, follow that all makes of plates are equally amenable to this treatment. Those which have a matt surface take the silver best, and some gelatines are much less liable to stain than others. If the negative is not filled up much in the shadows, and possesses proper gradation, silver intensification is certainly to be recommended. It must be borne in mind, though, that, since the silver is deposited on the surface, there is a tendency to flatten the image, as the half-tones receive nearly as much fresh silver as the high-lights. For this reason, it is less suitable for over-exposed, flat negatives, than some other methods.

Bleaching the negative with an iron or copper salt, and re-developing, has been recommended. I do not find that, after clearing with acid, to remove discolouration of the film which is produced, there is much increase in opacity. Negatives intensified with uranium salts are, I believe, found to get denser by keeping. The colour, also, is objectionable for portraiture. Two processes, which give very similar results, are Monckhoven's, and mercuric chloride, followed, after washing, with ammonia, the negative being then placed in water containing a few drops of a solution of sulphuretted hydrogen in dilute glycerine. The colour with either of these is a nice brownish black. I have here a series of little negatives intensified about eighteen months ago by various intensifiers, and, as far as I can judge, there has been no deterioration in those treated by the two methods just named.

These, however, will not always impart sufficient density to very thin, over-exposed negatives. For these there is, I think, nothing so useful as bichloride or iodide of mercury, followed, after a thorough washing, by Schlippe's salt. I do not recommend this for portraiture where it can be avoided, because of the reddish-yellow colour, which renders the retouching of such negatives a matter of difficulty. As far as preserving gradation and being under control go, it answers every purpose. I was somewhat surprised to see, some little time back, in the "Answers to Correspondents" given by a photographic journal, the statement that this intensifier was only suitable for line work, on account of the great density produced. Since density is easily regulated with a little care and practice, it seems to me that for exceedingly thin portrait negatives (which, of course, are only obtained now and again through accident) and for general out-door work (on which retouching is not usually required), and especially for large plates on which it is somewhat difficult to use silver or mercury, Schlippe's salt may form a serviceable and permanent intensifier.

LESSONS IN OPTICS FOR PHOTOGRAPHERS.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

LESSON XI.

IN the last lesson we gave an account of the brightness of an image without regard to any loss by the reflections from the surfaces. This loss is small, but still appreciable, it being about two per cent. for each surface when the light falls on it perpendicularly, and increasing rapidly as the angle is increased. The method of finding the approximate radius of curvature of the surface has already been given in one of the earlier lessons, in which it was shown that the reflected image of a point of light could be obtained and focussed from each surface of the lens. Now where there is reflection there must of necessity be loss of the light transmitted through glass.

If a simple lens be held opposite a candle, and the light examined by an eye-piece or focussing glass, the faint images of the flame given by reflection can readily be focussed. A reflection of a candle-flame from the surface is the example of what takes place from any bright object, and we shall consequently get a flare, as shown in the last lesson. It has usually been assumed that the halation seen in the photographs of strongly-lighted windows is simply due to reflection from the back of the glass plate, and that, if the plate is backed, so that no photographically effective rays are reflected, such halation will disappear. This is partly right and partly wrong. There will still be halation, but of a much diminished intensity. A good experiment to try is, to wet a ferrotype plate with collodion, and try what effect is obtained when photographing a well-illuminated window from the inside of a room. If the exposure be prolonged, halation will be there, but not nearly so markedly as where a glass plate is used. The halation that is found is due to the reflections from the surfaces of the lens, and may be called flare.

Cementing Lenses.—In previous lessons we showed how it was necessary to get rid of spherical and chromatic aberrations, and that this could be effected by the use of two lenses (or more) combined together. To avoid loss of light, for one reason, the curvatures in most single and doublet landscape lenses are so adjusted that the concave surface of one lens is the same as the convex surface of another. Thus two such lenses may be placed together so as to have no air space between them. If two lenses were not placed in optical contact there would be four reflecting surfaces, and there would be a loss of light amounting to nearly 8 per cent. of the whole incident light. If, however, the lenses are cemented together with a substance of fair specific gravity (for the amount of reflection from a surface depends on the difference in densities of the glass and the medium with which it is in contact), the reflection from the two interior surfaces of the glass will be perfectly negligible. The ordinary cement used is Canada balsam, which is colourless and tenacious, and dries hard. We may here state that, if a lens is required to be taken to pieces after being extracted from its cell,* it may be placed in cold water and gradually warmed, when the Canada balsam will melt, and the lenses can be slipped off from one another. The balsam may be removed with turpentine, and a final wash of dilute ammonia. For our own part, following a suggestion of a scientific friend, in some lenses we have replaced the Canada balsam by castor oil, which is equally effective as an optical agent, and allows the lenses to be separated at pleasure. Most photographic lenses are mounted so that unless a brass rim be lifted they cannot be removed, whilst others are only held in position by a screw.

Testing Lenses.—The glass of which a lens is formed should be homogeneous and not show striæ, and if possible it should, when examined by the polariscope, show no signs—or, at all events, very little signs—of polarization. Polarization means diminution of light, and is often produced in lenses by the mount pressing unequally on the

* The term applied to the brass mount holding the lens.

lens. Glass, when compressed, always exhibits this phenomenon in a greater or lesser degree. Small bubbles, slight surface scratches, in the glass are not detrimental, except that they cause a slight loss of light, those parts in which they occur being inoperative in forming the image. The glass should also be as colourless as possible; a greenish tint is almost worse than a violet one; a pure colourless glass is the best to aim at. The colour of a lens may be seen by placing it on white paper, and comparing the tint seen through the lens with that outside it. To test it for its spherical aberration, the plan recommended in Lesson VI. can be followed for a single lens, and for a double lens the diaphragm may be so cut in card that the margin of the lens is used in one case and the centre in the other, and then focussing with each.

To Test a Chromatic Aberration.—A newspaper or printed matter pasted on a card may be employed. This should be placed at a distance of some five to ten times the focal length of the lens, and at an angle with the axis. One portion of the printed matter should be focussed sharply visually on the ground glass. A plate should be substituted for the ground glass, and a photograph taken. If the photograph on examination shows the same portion of the printed matter to be sharp as those focussed by the eye, the visual and photographic foci may be considered coincident. Now photographic plates vary in composition, and it might well be that some slight discrepancy will show itself according as the iodide or the bromide of silver or a combination of both are used, but it will be so small as to be practically negligible if the optician has made the deviation of the indigo (G) of the spectrum to coincide with that of the yellow or green (between D and E). The reader should beware, however, if a want of coincidence be found, that he does not blame his lens wrongfully; if the ground glass of the focussing screen and the surface of the plate when exposed do not occupy the same position, the fault will be with the camera-maker, and not with the optician. If a piece of ground glass be placed in the slide (ground surface towards the lens) after the image has been sharply focussed on the focussing screen, and the image be still found sharp, then the camera is not in fault.

The Uses of the Swing-Back to the Camera.—The use of a swing-front to a camera, and also of the swing-back, have been much controverted at times, and even now, in France, the use of neither one or the other has been recognized by most camera-makers. For our purpose, we shall suppose that a lens may be represented by a pinhole, and that therefore it is non-distorting.

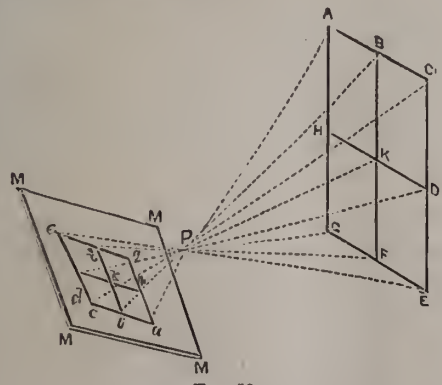

Fig. 53.

Let A B C D E F G H be a window-frame, B F and H D sash-bars, and let P, the pinhole which stands for the lens, be about the same level as the bottom of the window. Let M M be the focussing-screen, *k* the centre of it. Then, in order to get the whole of the window in the screen, the axis, P *k*, of the lens must be tilted, and be in the same line as K, the centre of the window. The focussing-glass, M M, will therefore be tilted, supposing no swing-back be used. If lines be drawn through P from all the corners of the window on to the screen, we get a figure *a b c d e f g h*. Now it will be evident on inspection that A C is further away from P than is G E, and that therefore *a c* will be smaller than *g e*, and the image of the window will therefore not be rectangular, but the top of the panes will be narrower in the image than the bottom of the frame. This is what would actually appear to the eye if it were always directed towards K; but as the eye, on the whole, sees objects in a vertical plane, the perspective appears false. In order to remedy this apparent falsity, if the focussing-screen be tilted till it is in a vertical plane, the image of the window will appear rectangular, and not distorted, for then the distance of A C from P will be to the distance of *a c* from P in the same proportion that the distance E G from P is to the distance *e g* from P, and therefore they will be equal. This was only one particular example of the use of the swing-back, but any other case equally applies. It should therefore be recollected that in order to prevent distortion of a picture with a non-distorting lens, the swing-back of the camera should always be vertical.

Should the swing-back be tilted, a reference to previous figures will show that a smaller diaphragm must be employed than if the focussing screen remains perpendicular to the axis of the lens. Again, that part of the picture nearest to the camera requires a longer focus than the part furthest away from it; now, if the lens be pointed upwards, as is usually the case when any tilt has to be given, the part of the focussing screen nearest to the lens is that on which the foreground is depicted. In most cameras there is usually a rising-front, and by raising it, the whole image is raised bodily; but this can only be employed when the lens contains a field of view larger than the plate. If the camera can be kept level—*i.e.*, the axis of the lens pointing horizontally—and the whole of the image included by using the rising-front, then the swing-back must not be tilted, and there will be no distortion. For focussing an architectural subject, our advice is to use the rising-front as far as the lens will cover the plate, and then to tilt the camera and use the swing-back. The student should consult the figures given in a previous lesson on the illumination of the field, to see what effect the foreshortening of the diaphragm will have on the illumination on the tilted screen.

INTENSIFICATION.

BY W. N. JAY.

After laying an under-exposed plate in the usual bichloride of mercury solution until its surface attained the density of city milk, I washed it thoroughly.

Soda takes the place of ammonia in the pyro developer—why should'nt it do so here? thought I, so I tried the effect of a weak soda bath on the mercury-coated plate, and after leaving it in the solution for a few minutes, a rich, brown-toned negative was the result. A number of experiments led me to think a strong solution of sulph*ite* of soda works best, producing clear black tones of good printing quality. I hunted up a number of my "first attempts," and by the above method saved a good many of them. This may be old news to some of your numerous readers, though quite new and highly satisfactory to the writer, who thinks it is worth a trial, anyhow.—*Philadelphia Photographer.*

PROCESS FOR PHOTOGRAPHIC PRINTING IN COLOURS.

BY J. SHERLOCK.*

In this process it is necessary to use *coloured negatives*—that is, ordinary negatives which have been hand-painted in their proper tints with transparent colours.

1st. Take a piece of ordinary sensitized paper and wash it to remove any free silver nitrate.

2nd. Place the washed paper in a solution of proto-chloride of tin, and expose to weak light until the silver chloride is reduced to sub-chloride, and the paper assumes a uniform grey colour.

* Read to the Photographic Section of St. Helen's Association for the Pursuit of Science, Literature, and Art.

3rd. Float the paper in a mixed solution of chromate of potash and sulphate of copper, and dry in the dark.

The paper is now sensitive to all the colours of the spectrum, and by printing on it with a coloured negative the colours of the negative will be reproduced. After printing, wash with cold water, and dry.

[We wish we could hope to see passable reproductions of colour produced by such a method.—ED. P. N.]

Notes.

Rather more than four months are available for those who may intend sending pictures to the Pall Mall Exhibition: the 25th of September has been fixed as the final day for receiving exhibits.

It has been suggested that in view of the abolition of their office, the whole of the Court of Aldermen and Common Council should be photographed, so as to form a sort of "In Memoriam" picture, which will find a suitable resting place in the Guildhall Library. We would add that this work should be entrusted to Mr. Alderman Nottage, were it not that under the circumstances the task would probably be too sad for the worthy alderman to undertake.

To test a sample of varnish, according to Herr Grundner, one should varnish a negative, and then leave it in water.

Mr. Gill's ideas as to the importance of mapping out the heavens by photography were alluded to last week, and he makes the following observation regarding Mr. Common's photograph of the nebula of Orion, which picture was issued with the NEWS in December of last year. "If now we were to suppose one hundred years to elapse, and no further observation of the nebula of Orion to be made in the interval; if in some extraordinary way all previous observations were lost, but that astronomers were offered the choice of recovering this photograph of Mr. Common's, or of losing it and preserving all the previous observations of the nebula recorded in Professor Holden's book—how would the choice lie? I venture to say the decision would be—Give us Mr. Common's photograph."

The most beautiful and rare *objets d'art* in the Fountaine Collection were photographed, and included in the half-guinea edition of the catalogue issued by Messrs. Christie and Manson. A photographically-illustrated catalogue of the Leigh Court Gallery is also to be published in connection with a picture sale, and the sale will be emphatically *the* picture sale of the season.

Mr. C. Ray Wood shortly proceeds to Switzerland to carry out some experiments on solar physics; the expedition being under the auspices of a committee of the Royal Society.

The main object is to secure photographs of the corona, and it is hoped that by working on the lines already laid down by Dr. Huggins it will become possible to secure a comprehensive series of coronal pictures, and the value of a regular series of photographs over such occasional ones as have been obtained during an eclipse will be apparent to all.

Dr. Huggin's method may be briefly described as one depending on a selective filtration of the light, such media as solution of potassium permanganate and blue glass being used to cut off the intense glare of the direct solar rays. The clear atmosphere of a high station in Switzerland will materially conduce to the production of useful photographs.

The production of drawing room portraits is not unlikely to become an important branch of work with the fashionable photographer, and in Paris we understand that Pierre Petit, who introduced this class of portrait some months since, has as many engagements as he can fill.

As an excellent excuse for not seeing visitors, the *Photographie à Domicile* has its advantages; for what excuse can be more satisfactory than that a picture is being taken?

When home portraiture in the drawing-room is undertaken, it is highly important to be provided with abundance of white screens or reflectors, and for convenience and portability nothing can surpass the plain white paper in rolls as sold for the use of paper-hangers.

Circumstances may render it necessary not only to lay this white paper over the greater part of the floor of the apartment, but to cover much of the furniture, and attach it to the walls with drawing-pins.

Old newspapers, however, make a fair substitute for the plain paper, as the proportion actually covered with printing ink is really very small. Many photographers would be surprised to see the improvement as regards lighting which may occasionally be realized by laying a few newspapers on the floor between the camera and the model.

Some weeks since we alluded to the "Baby Competition," initiated by a reckless contemporary, which undertook to adjudicate on the relative charms of the photographs of the infants of its subscribers. A New York paper has just carried the competition coupon notion to yet lower depths, and prizes are offered for the most beautifully ugly pug-dog. The canine photographs, or "dog-cartes" as the editor calls them, are pouring in.

The mucilagenous seeds of the *Psyllium* yield, according to Dr. Liesegang (p. 395), a sizing material which is of especial value in treating collodio-chloride prints. The mucilage of the seeds in question is largely used in France and Germany as a stiffening material for muslin and other fabrics; and, indeed, this use of the seed is not new, as we believe that Dioscorides refers to something of the kind.

Mr. John R. Jackson, of the Kew Museum, is good enough to give us the following information bearing on Dr. Liesegang's suggestion to use the mucilage of the *Psyllium* seeds. He says:—"Their mucilaginous property is common to many species of the *Plantago*, notably

the Indian one, *Plantago Ispaghula*, a few seeds of which I enclose. You will see by putting them into water that they produce a large quantity of mucilage. They are used medicinally, and if such a sizing material for paper is really a desideratum, it might be worth while to employ these spogel seeds, as they are called, in the water."

A photographic portrait is often used to give an air of truth to a story, and the sham detective who recently obtained goods from the Dover tradesmen by showing a carte-de-visite, and saying it was the portrait of a dynamiter for whom he was looking, may well think highly of the camera as an exponent of truth.

The total receipts of the Brussels Exhibition, held in August last, were 8,137 francs. This sum includes a subsidy of 500 francs from the city authorities, and half as much from the Ministry of the Interior. So evenly were expenses balanced against receipts, that only 121 francs remain over to go in the general fund.

The *Atheneum* asks, *apropos* of a paper by a young lady "On the Blastophore of the Newt," read at a recent meeting of the Royal Society, "Is it a sign of the times?" If so, it may not be long before we shall have ladies rising at our societies, and gravely discussing the merits of ruby *versus* green glass, or laying down the law on the vexed question of the fading of silver prints. It is doubtful whether masculine photographers do or do not derive comfort from the fact that at present lady photographers are few and far between. There is an average of about three at the monthly meetings of the Photographic Society. But there is no reason why they should not increase. The manipulation of gelatine plates is not so "messy" as collodion, and, this great objection removed, we may expect to see ladies invading the photographic profession as they have invaded almost every other.

A correspondent wants to know what he is to do with his spoilt gelatine plates, of which a large stock—from various sources of failure, many of sitters, bad expression, over- and under-exposure &c.—has accumulated. As he does not make his own emulsion he cannot utilise them as in the collodion days; what is to be done? Will the makers buy them back at a reduction?

Few photographers care to treat an unpromising sitter as Rejlander treated a lady of title who visited his studio. "I will not take her, oh! she is ugly;" exclaimed the artist, as he left the studio, trusting to others to explain matters.

When Rejlander was down with his last illness, a messenger arrived from a photographic stock house, with a note to say that unless payment of an account was made by a certain time, legal proceedings would be taken.

"Bring the camera!" said Rejlander; and a wonderful picture was taken of him as he sat up in bed with bared breast, disordered hair, and the mark of the hand of death upon him. Shortly before his last hour the picture was sent with the message, "Take your pound of flesh from that!"

Not many have seen that picture, but those who have seen it are not likely to forget it. Indeed, we only know of one copy in existence, and time has told upon that.

The statues and bas-reliefs of Dinatillo on the high altar of the Church of the Santo at Padua, have always been the despair of photographers. Apart from the difficulties presented by the colour of the bronzes, some are situated so high as to be practicably unattainable, while others are so low that it is necessary to sit on the ground so as to view them in their true perspective. Dr. Wilhelm Bode, with the aid of the Berlin Museum, has, with much trouble and at a great expense, overcome the obstacles by taking mouldings of the compositions in plaster of Paris and photographing the casts. Twenty-five photo-gravures have now been issued, and are spoken of as leaving nothing to be desired.

The Prefect of the St. Petersburg Police has come to the conclusion that to do a thing too much, may be worse than not doing it at all. And this is his reason: some time since, a certain Nihilist being "wanted," the Prefect sent round to every police bureau in the Empire not one photograph merely of the desiderated man, but six *cartes*, each showing him in a different position, and eagerly awaited the result. He was not long kept in suspense. In the course of a week or two he received a communication from the superintendent of a distant station far away in the wilds of Trans-Caucasia:—"Your Excellency," it ran, "I have the honour to report that I have already caused to be arrested four of the atrocious criminals whose portraits you recently sent, and from information received, confidently hope to capture the other two very shortly.—I have the honour to subscribe myself," &c., &c.

In this country there is a well-known proverb that deprecates the placing of a cart before a horse. The St. Petersburg Prefect of Police, though, has reason to wish he had not placed his *cartes*—at least six of them—before a donkey.

"The lime-light operations at Drury Lane Theatre were carried on by incompetent men, and in an unfit place under the stage." Such is the appendix to the jury's verdict on the recent fatal accident. As fearful consequences might follow an explosion in a crowded theatre, the arrangements might well be under the supervision of a qualified and responsible person.

The problem of directly separating oxygen from the a may perhaps be solved by taking advantage of one of t physical peculiarities of red hot silver; that of allowi oxygen to steadily filter through it. Those who ha worked with silver in the furnace know what beautiful fe like growths are sometimes thrown up as the me solidifies, and a part of the dissolved oxygen sudde escapes from the half fluid metal.

Photographers have been so often reproached for distorting the hands and feet of their sitters, especially when the picture is of a size larger than a whole-plate, and with obliterating the eyes or giving them a washed-out look, that it is quite refreshing to find the *Athenæum* last week saying that "one of our magnificently-paid portrait painters vouchsafes to produce faces with only one eye fairly drawn, and with legs not drawn at all." After this, photographers have a right to ask painters who are criticising camera pictures to look at home.

A curious instance of an artist-painter working at a weekly salary was brought to light at the Nottingham County Court this week. Mr. John Holland, who is known as a rising artist, received a contract sum of about £5 per week for all the pictures he painted, the employer being a publican in the town. One can see the possibility of a curious copyright dispute arising out of such an agreement. Just as in the case of Nottage *v.* Jackson, a question might arise as to who was the author of the pictures—master or servant?

The camera and camera-legs on the river terrace of the Houses of Parliament, which have so often puzzled the passengers on the penny steamers, would appear to be kept in readiness for the purpose of photographing distinguished visitors. King Tewhaio, we are told, was the latest sitter. But what becomes of the photographs, and who pays the photographer? Is he an officer of the House?

A West of England photographer, with a specialité for baby portraiture, guarantees, not a speaking likeness, but a "crying" one!

Patent Intelligence.

Applications for Letters Patent.

8771. HENRY JOSEPH SHAWCROSS, Office for Patents, 6, Lord Street, Liverpool, Lancashire, Bachelor of Engineering, for "Improvements in the manufacture and subsequent treatment of sensitive paper for copying drawings, documents written on one side, and the like, by photography."—Dated 10th June, 1884.

8852. FREDERICK WOODWARD BRANSON, Leeds, Yorkshire, Pharmaceutical Chemist, for "Improvements in the means for uncapping and capping the lenses of photographic apparatus."—Dated 11th June, 1884.

9026. HENRY GARDNER, 166, Fleet Street, London, Patent Agent, for "Improvements for producing from photographic negatives, blocks or plates suitable for typographic surface printing."—A communication to him from abroad by George Sutherland, Adelaide, South Australia, Journalist.—Dated 16th June, 1884.

Specifications Published during the Week.

5154. JOSEPH BROWN, of 43, Halsey Street, Cadogan Square, Chelsea, Gentleman, "Improvements in the method of obtaining incised or raised designs or patterns on the flat or other surfaces of steel, iron, copper, brass, zinc, bronze, or the more precious metals, for printing, stamping, engraving, and for ornamental purposes."—*Provisional Protection only.*

In carrying out my invention the improved process is as follows:—I take a hand drawing, print, or engraving from which I obtain an engraved plate in one or more sizes, by any of the well-known or ordinary methods either by photography, lithography, or copper plate; from this plate or printing surface I obtain an impression in a bituminous, asphaltum, or resinous varnish or material sufficiently strong to be acid resisting; I then take this print in bituminous or other varnish and transfer it by slight pressure, on to the surface on which I intend the drawing to be reproduced; the paper being removed leaves me the impression in the bituminous ink or varnish perfectly intact on the plate; I then proceed to protect those parts not forming the design with a wax or other protective varnish, and the print thus transferred to the plate is then gently sprinkled with bituminous powder, should the case require it. The plate or metal surface in its thin condition is submitted to the action of acids, or an electric battery, or any well-known mordant until such parts unprotected by the bituminous varnish are acted upon until the required depth is obtained. This process particularly applies to the production of plates for pottery printing purposes, calico or other textile printing, the production of cloisonné or mosaic work in enamels, for the preparation of dies for metal and paper printing and stamping, for leather stamping, and for obtaining designs on any other metal above referred to. Also for obtaining designs on cylindrical rollers either for repeated patterns or otherwise, as well as for producing raised type printing blocks. In cases where the pattern repeats itself I build up, as it were, or repeat it by multiplication to any extent required.

5324. JOSEPH JULIUS SAOHS, of Union Court, Old Broad Street, in the city of London, for "Improvements in or connected with the production of surfaces for printing, embossing, or ornamental purposes."

My invention has for one of its objects to produce reproductions from photographs, drawings, paintings or the like, in which reproductions are obtained of the half-tones, full tones, and lights and shades, so as to give a faithful representation of the original. In order to effect this it is necessary to print from the original, or a transparent reproduction of the same, upon a sensitive ground—such as one of chrome gelatine—with the interposition of a transparent medium, upon which is made a number of fine dots, or a grain. This grained or dotted medium it has been proposed to obtain by means of prints from surfaces which have been lined or "cross hatched" by hand and in other ways, but hitherto it has been impossible to obtain satisfactory results by these means. According to my invention, I obtain a dotted or transparent medium as follows:—

I take a metal roller or other surface of metal or hard material, and I submit it to the action of the impact or hard particles such as is obtained by the projection of sand propelled by a blast against the said surface. I thus obtain a grained surface of a degree of fineness in accordance with the fineness of the hard particles employed. I then roll over the surface thus obtained, or cover it with ink or an opaque substance, and I take an impression therefrom upon a transparent medium—such, for example, as upon paper or the like, prepared as described in the specification of my Letters Patent, No. 3948, dated 14th August, 1883. I take the transparent medium thus covered with an opaque grain, and I cover it over or place it upon the photograph, drawing, painting, or original to be copied, and then place these together over a sensitized layer, such as chrome gelatine, which will become hardened on exposure to light, and I thus obtain by the light passing through the grained surface and the photograph, drawing, painting, or the like, a reproduction of the same upon the sensitive layer which, when it is upon or has been transferred to a roller or other surface, and this is treated and etched according to any suitable process (such, for example, as is explained in the specification of my prior patent, No. 266, dated the 21st January, 1881), will give a printing or embossing surface from which impressions can be taken resembling the original. For the purpose of the transfer to the roller or other surface, the sensitive layer may before exposure be covered with a film of asphaltum or other suitable resist. The grained print or reproduction from the surface treated by the sand blast may be obtained by direct printing upon a transparent medium, or by any suitable direct or indirect process of transfer, or it may be printed directly upon the photograph, drawing, painting, or the like, without the intervention of a special transparent medium. In order to give a colour-holding surface to the design eventually produced upon the roller or other surface, I may treat the same (after it has been etched in the etching bath) with the sand blast so as to give a roughened surface to the sunk parts, the raised parts being protected by the original, or a special resist or covering.

A further object of my invention is to obtain ornamental effects upon metal surfaces to resemble inlaid work. According to this

part of my invention, I take a metal surface, and I roughen it by submission to the sand blast or the impact of hard particles, and I then cover it with a sensitive layer, which I expose to the action of light beneath the negative or design to be reproduced, whereby the parts exposed to the action of light are hardened. I then roll over or cover the sensitive film thus treated, with a resist or ink, which adheres to the hardened parts of the sensitive layer, but not to the unhardened parts, which latter may be then removed by washing or in any suitable way, leaving the metal at these parts exposed. A metal preferably of another colour or kind may then be deposited by electro-deposition upon the exposed parts, and then, on removing the resist and hardened gelatine from the other parts, the metal surface will have the appearance of inlaid work. Instead of the process of electro-deposition, I may bite into or through the metal at the exposed parts, whereby I obtain perforated ornamental metal work resembling lace patterns or other designs, which give very beautiful effects when used for decorative purposes. In the process wherein electro-deposition is used, the metal at the exposed parts may, before undergoing the process of electro-deposition, be again submitted to the sand blast to give different grains for the design and the ground. What I consider to be novel and original, and therefore claim as the invention secured to me by the hereinbefore in part recited Letters Patent, is :—

First. In the production of rollers or surfaces for printing or embossing purposes, obtaining by means of the sand blast, or the impact of hard particles, a surface from which a dotted or grained medium is produced, which is placed, together with a photograph, drawing, painting, or the like, upon a sensitive layer or material, which is upon, or is afterwards transferred to, the roller or surface to be etched, and afterwards treating and etching the said roller or surface all substantially as and for the purpose hereinbefore described.

Second. In the production of rollers or surfaces for printing purposes, obtaining a colour-holding surface by submitting the said rollers or surfaces to the action of the sand-blast or the impact of hard particles after the design has been etched or produced on the said rollers or surfaces, and whilst the parts which are not to hold colour are protected by a material or substance capable of resisting the action of the said sand-blast or impact substantially as hereinbefore described.

Third. Obtaining ornamental work by first roughening or graining a metallic surface by the sand blast or the impact of hard particles, then covering it with a sensitive layer and exposing it to the action of light beneath the negative or design to be reproduced, then rolling over or covering the same with a resist or ink, and then removing the soluble parts of the sensitive layer, and afterwards submitting the exposed parts to a process of electro-deposition, or of etching or biting through, or, as an alternative, submitting the said exposed parts again to the action of the sand blast, or the impact of hard particles, and afterwards to a process of electro deposition, all substantially as and hereinbefore described.

PROTECTING THE SURFACE OF COLLODIO-CHLORIDE PRINTS WITH EXTRACT OF THE SEEDS OF THE *PSYLLIUM*.

BY DR. LIESEGANG.

IN a former communication I recommended my readers to soak the washed collodio-chloride prints in an ammoniacal solution of bleached lac, which imparts to them a very hard surface, like that of albumen prints. As, however, this solution is not easy to prepare, and as it changes through the evaporation of ammonia, I have tried to find out another medium, and I think the best of all I experimented with is an extract of the seeds of the *Plantago Psyllium*. A convenient quantity of the seeds is covered with ten or twelve times its volume of cold water, and after macerating for a day, with occasional stirring, the liquid extract is filtered, a small quantity of methylated spirits being now added. Those who prefer to mount the prints when dry, may add a little glycerine. After washing, the prints are soaked in this fluid for a few minutes, and dried.

Even prints made on paper prepared with soluble gelatine may, after this bath, be treated like ordinary albumen prints without the collodion film cracking.

If it is desired to give the prints a coating of varnish, I find a solution of one pound of copal in two pounds of linseed oil gives a splendid and most resisting covering if applied by a pad of cotton or a brush.

Prints treated in this way may be regarded as permanent—neither light, nor air, nor humidity having the least influence upon them.

ILLUMINATION OF THE DARK-ROOM.

BY W. E. DEBENHAM.*

TAKING the average of three observers, it was found that the distance at which printing could be read with light passing through green supplement was within a trifle of half that required when the cobalt was used. This indicates a superior power of illumination of between three and four. I have here a printing-frame, containing strips of the same green and cobalt glasses, each in union with the same stained red. I will now expose a plate behind these to the light, and develop together. It will be seen that the red and blue yield a powerful image, whilst the red and green give only a trace. As a supplement to stained red glass, therefore, the green allows three or four times as much working light to pass, and gives much more protection to the plate than the cobalt. The cobalt, in fact, acts by cutting off the useful yellow illuminating power, and renders the red deeper than before; whilst the green, by allowing the yellow rays to pass (and remember that the so-called stained red is really an accumulation of a yellow transmitting medium), acts by cutting off some of the red, and restoring a yellow character to the light. How much of the additional protection afforded by the green glass is due to the removal of the red, and how much to the cutting off of the other end of the spectrum, it is not necessary now to decide. I should think, however, that in addition to the greater safety and the more luminosity, almost everyone would prefer, as less disagreeable to work by, the yellowish light with the green supplement, to the crimson with the cobalt.

As a method of working independent of coloured screens, it has been recommended as a good working method to employ the comparatively white light of a candle or lamp, taking care to allow no rays to fall direct upon the plate, but to use only the light reflected from the ceiling and walls of the apartment. Those to whom any coloured light is offensive or objectionable, may be glad to know of a method by which they can use a light of the same apparent character as the bare candlelight, but of much greater safety. Here is a lantern containing two paraffin lamps, one furnished with stained red, and the other with a green glass. By allowing the light from these to fall upon a sheet of white cardboard, and stretching a sheet of white paper in front, a light is produced which is quite as white as that given by one of the lamps when used with no coloured glass, and illuminating the card in the same manner, and turned to such a height as to give equal illumination at a given distance from the screen. Mr. W. K. Burton, who kindly assisted me in making this experiment by taking the reading distance, and exposing the plate at that same distance, considered, indeed, that the composite white light was in this case decidedly the whiter, less yellowish of the two.

I will show you both, and I think you will agree with him. On developing the plate we found much less image on the plate exposed to the composite white light than on the other, and this, indeed, was to be expected, as both glasses used cut off the violet and ultra-violet rays, the most powerful photographic portion of the spectrum. I do not recommend this light for absolute saftey, but upon a sensitive plate an exposure full square to the light for a minute at a distance at which small print could be read, gave the merest trace of a mark, such as would not be recognized as fogging if there were no sharp edge to mark. Now, there is never any necessity for giving a plate so much exposure to the developing light as this is equivalent to, those who are particularly sensitive to coloured light may, using obvious precations, safely work with a light of this description.

From the experiment described with the ruby, the stained and the canary medium, the latter shows the most powerful power; but, at the same time, it transmits less lumi-

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When these conditions are equalised, the comparative results show the least safety for the ruby; with the other two they are about equal.

With ruby glass, as stated a week or two back by Mr. A. Pringle, in describing the work of a sort of committee of investigation of well-known photographers in the North, the result was that canary medium showed less actinic effect than ruby glass in proportion to its luminosity. That stained red, and a yellow material, like canary medium, should be about equal, is only what might be expected from the consideration that stained red is, as has been pointed out, an accumulation of yellow, and yellow light passes largely through it. To compare red light with yellow light, a medium of true red colour should be used, and then the experiment comes out in favour of the yellow medium. There is another consideration which also tells in favour of the yellow. The plates we use, and to see which we require the illumination of our dark-rooms, are of a greenish-yellow, and the reading tests, to be accurate for the work, should have been on paper of a colour similar to that of the plate. These tests were, however, made on ordinary printed matter, and when—with the only observers with whom I had an opportunity of trying, Mr. J. Cadett, and Mr. J. J. Briginshaw—a gelatine plate with writing upon it was substituted for the ordinary printed paper, it was found that it had to be brought relatively nearer to the red than to the yellow light, before the writing could be deciphered.

If the balance of photographic and luminous effect of yellow and red light were equal, we should choose the former, on account of its cooler, less irritating character, and the comparative absence of feeling of strain or fatigue, which most people, at all events, feel when compelled to pass any length of time in one as compared with the other. When we add to this fact the consideration that it is probable that some are now permanently and hopelessly injuring their eyesight in the employment of dry-plate manufacturers, and of busy photographers, I think great responsibility rests upon those who would strive to perpetuate the present state of things.

The following propositions may now, I believe, be considered as established:—That the great difference in relative sensibility to different colours stated to exist in the two substances, bromide of silver in gelatine, and the ordinary bromo-iodide bath plates, does not so exist; and that therefore the difference in the colour of the illuminatiug medium said to be required is a mistake. That yellow light gives more luminosity in proportion to its effect upon the photographic plate than real red light. That "stained red" glass owes much of its luminosity to the fact that it is an accumulation of yellow medium. That green glass cuts off both ends of the spectrum, and, therefore, in addition to rendering the light cooler, is a considerable protection. That green glass used as a supplement to "stained red" allows more illumination to pass than cobalt so used, and is much more strongly protective of the plate by obstructing photographic power.

ELECTRIC LIGHT PORTRAITURE.

BY G. H. SHERMAN.*

THE subject before us to-night might well have been assigned to better hands; but I will do as well as I can to entertain you, and give you my method of using the electric light in photographic portraiture. I have had electric light on the brain, as it were, for a year or more, and having seen it established as a general illuminator in our little city of Elgin, I thought I would try it on negative making. I had talked with several who had used the light to some extent, and all thought it would do; but it was quite expensive, some parties having expended several thousand dollars in the experiment.

After witnessing the demonstration at Milwaukee last August, and having seen some of the work from other sources, I felt a little discouraged, but still I was bound to see what I could do with one light. I got no expensive plant—merely one light from circuit of thirty lamps used in our stores. The lamp is of 00 candle power, of the Van Depoele system, for which I pay 12 50 per month. So you see that I hazarded very little in the ial. I have as yet attempted nothing but bust and half-form, my arrangement of the light is more adapted to these styles. will now give you a description of my mode of operating. vill begin with the light, which, as I said before, is one of the Van Depoele lamps, suspended near the centre of my reception room. It is arranged with cord and pulley, so as to be raised and lowered to any elevation. I use a large, ground-glass globe. I wish to say in this connection that, as far as my experience and observation go, I think the Van Depoele light is the best for photographic uses. We next have a circular concave reflecting screeu of fine white muslin. This is also fixed to a standard, and made adjustable to any height and angle. This I place within a foot of my lamp. I also have a mirror about 16 by 24, made adjustable. Next are my screens, &c. On the side next my lamp I have a screen of white muslin, 7 by 8 feet. In the centre and near the top is an open space, 2 by 3 feet, which I fill with one or two thicknesses of blue gauze. This softens and diffuses the light. In the centre of this gauze I place an oval piece of white tissue paper, sometimes two thicknesses, which I arrange so as to come directly between the sitter and the bright spark of the lamp. This also has a tendency to soften and diffuse the light. From the top of this side screen I have a projecting screen of the same material coming out over the sitter, adjustable to any angle. This, when used properly, serves to give the combined top and side light effect. Next I have a large screen, or reflector, which I place on the opposite side of the sitter. This is also adjustable. I also have a hand screeu or white muslin reflector which I use to throw the light in any direction, aud soften shadows. I use the ordinary background, or sometimes unbleached muslin. I light the whole or any part of the sitter or background with my mirror reflector.

This is my simple *modus operandi*, and if it will do anybody good he is welcome. I make no issue with Van der Weyde, Kurtz, or any of the "high-lights" in photography. I do not say that my way is best, or that it cannot be improved upon; but I do say that it is simple, cheap, and, with me, successful. I have received numerous letters from parties asking information, &c., all of which I have answered as best I could. I will say to any and all, get a lamp and try for yourselves.

I have used the light for printing, with good results; also for copying.

* Read before the Chicago Photographic Association.

Correspondence.

EXTREMELY SMALL DIAPHRAGMS.

SIR,—The question which has been put by Mr. A. G. Brophy, and on which you were good enough to ask my opinion, is an extremely pertinent one, and certainly requires very great consideration. The effect of diminishing the aperture to a lens naturally divides itself into two parts:—1st, On the increase in the sharpness of image; and 2nd, brilliancy of image. As regards the first, with ordinary stops as supplied with lenses, we may take it that increased depth of focus would be attained by using the small stops, as I endeavoured to show in my "Lessons in Optics." An object to be in focus must have the image of every point of it, whether close or far from the lens, represented by a disc of confusion not greater than $\frac{1}{100}$th of an inch. By diminishing the aperture an increased depth of focus is, of course attained.

Suppose we have rays coming from a distant point, and also from another point near the lens, falling on a lens corrected for spherical aberration, the former will have their true focus nearer the lens than the latter (see

Fig. 1.

fig. 1). It is manifest that any plane, *a b*, which moves between the two foci, will never show sharp images, because the discs of confusion will always be greater than $\frac{1}{100}$ of

an inch in diameter. If the image of the distant point be sharp, the image of the near point will be represented by a disc having a breadth *a b*. How, then, can this be corrected? Let us place a small stop in front of the lens (fig. 2), and immediately the angle of the outside rays

Fig. 2.

forming the images are narrowed, and between the two true foci there will be a plane on which the discs of confusion of the images of the two points will not be more than $\frac{1}{100}$ inch diameter. Hence, depth of focus is attained absolutely by using a small diaphragm. There is no inherent quality in the form of any lens which will give depth of focus; diminishing the ratio of the aperture to the focal length alone will affect it. The real question is, however, whether or not the opticians have supplied us with stops which are just on the boundary where diffraction phenomena are negligible. Now, when a bright point, such as a star, is observed through a telescope, corrected, we will suppose, for chromatic and spherical aberrations, the image seen through the eye-piece is not a point, but a disc of measurable size, surrounded by bright rings, of which three may be recognizable.

The whole question of these rings has been treated by Fresnel, and subsequently by Airy, and the following formula was theoretically deduced.

If r is aperture of the lens in inches, and S the angular semi-diameter or radius of a ring in seconds, as viewed from the centre of the object glass, and if a mean wave-length of the yellow be taken as ·000022 inches, then

$$S = \frac{n}{1{\cdot}3846 \times r}$$

n having the value 5·12, 8·43, or 11·63 for the light rings, and 3·83, 7·14, or 10·17 for the dark rings. From this we can calculate approximately what would be the diameter of the disc of confusion for any stop.

Suppose the focal length of the lens to be twelve inches, and the aperture $\frac{f}{120}$, this being the aperture suggested by Mr. Brophy. Then the edge of the disc forming the image of a distant point will be given by calculating from the above formula, using $n = 3\,83$, which the value to be employed for the first dark ring which surrounds this disc.

This gives S = ·27 seconds of arc.

As it is viewed at a distance of twelve inches, the radius of the disc of confusion is $\frac{1}{425}$ of an inch, or the diameter of the disc of confusion, about $\frac{1}{300}$ of an inch, which is well within the limit laid down. This is not the final value, however, for theory has shown that the intensities of the three bright rings outside the disc are, $\frac{1}{57}$th, $\frac{1}{24}\frac{1}{0}$th, and $\frac{1}{85}\frac{1}{0}$th of that of the disc, and evidently the first one will have to be taken into account. The radius of this we may arrive at by taking n=5·12 for the light beyond to the edge of the second dark ring, will be neglibible. Treating this in the same way, we find that S=37 seconds of arc, and the semi-diameter = $\frac{1}{400}$ of an inch, or the diameter = $\frac{1}{292}$ of an inch, which is still within the proper limits of the disc of confusion. Hence a stop of $\frac{f}{120}$ is safe as far as diffraction goes with a lens of twelve inch focal length. With twice this focal length it is evident that the limit would be reached, since the total diameter of the disc and ring, light forming the image of any point of an object, would be nearly $\frac{1}{100}$ of an inch. It would thus appear, so far as optical conditions are concerned, that a stop of $\frac{f}{120}$ is quite admissible where lenses of ordinary focal length are employed. The next question is as to the brilliancy of the image.

This really depends on the answer to the question as to whether intensity of light and time of exposure are interchangeable. That is, supposing with an intensity of light 1, and exposure 1, do you get the same density of developed image with intensity of light $\frac{1}{100}$ and exposure 100? This is, perhaps, a debatable point, but my own answer to such a question is, that such would not be the case. The increased exposure would not make up for the diminished intensity. Again, you have only two intensities of light to deal with, which are as 100 to 1. If you take one aperture to the lens, you will get a different contrast in density to that which would be obtained by using only (say) $\frac{1}{40}$ part of such an aperture, though the exposure was proportionally prolonged. I have already touched on this point at the Royal Institution, and shall probably have more to say on the subject at an early date.—Yours faithfully,

W. de W. Abney.

PHOSPHORESCENCE DURING DEVELOPMENT.

Sir,—I have just developed several of Vérel's gelatine plates, and have had occasion to push the development of some plates, and on immersing two of them in the alum bath, dropping them on the top and letting them sink, I observed, just as the solution flowed over the surface, a distinct phosphorescent appearance, a cloud of light green rose from the surface, and instantly vanished; the development was with a strong dose of potas. carb. and pyro, no bromide. The light, though distinct, was faint and momentary, and appeared to rise in a soft cloud. It being about 10 p.m., and my eyes recovered from the effect of daylight, the lamp used being not very strong, and the alum almost in the dark, were all in favour of seeing well. But no doubt if my eyes had lately been exposed to a strong light, I should not have seen the apparent phosphorescence.

Having read your remarks on Carey Lea's theory in a late number of the News, I thought this might interest you.—Yours truly,

E. Williams.

THE DRYING OF GELATINOUS TISSUE.

Sir,—With reference to a note on the drying of gelatine tissue in your issue of the 13th inst., I would remark that in the course of some experiments on dryiug carbon and gelatino-bromide tissues, I once attempted to prevent the curling up of the tissue ou drying after the plan suggested by Mr. Haynes. In my hands the plan failed entirely, the cause, I think, being evident enough. A thiu gelatine film wetted, and left to dry unattached to a support, will contract about the eighth of its length; if dry paper be coated with a gelatinous preparation, and allowed to dry, the gelatine contracts, and as the dry paper undergoes no contraction, curling will necessarily result. The use of wet paper would meet the difficulty if it possessed the same contractile power as the gelatine; but this is not the case. By drying gelatinized paper after the method under notice, the layer of gelatine is, to some extent, prevented from contracting; but the amount is almost inappreciable, and quite insufficient to prevent subsequent curling when the tissue is put by in a dry place.—Yours faithfully,

W. Noverre, Lt.-Col.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 12th inst., Mr. A. Cowan in the chair.

Mr. A. L. Henderson, in speaking on the disappearance of an image from a plate shown by him on the 29th ult., showed two more plates which, after exposure to gaslight during the previous

meeting, were marked by several of the members present. They were placed in a solution of bromide of potassium and dilute nitric acid; after washing, one plate was exposed in the camera and developed without obtaining any image; the other, which received a much longer exposure (one minute), resulted in a fairly exposed negative. In reply to a question from Mr. Burton, he considered both the acid and bromide contributed to the result.

Mr. J. BARKER attributed the phenomenon to the nascent condition of the exposed silver bromide, and instanced the old method of treating Daguerreotype plates with free bromine to destroy the effect of light.

Mr. W. K. BURTON held that free bromine would destroy an image, whether the same were developed or not.

The CHAIRMAN then called upon Mr. W. Coles to deliver his lecturette on "Altering the Density of Gelatine Negatives" (see page 388).

Mr. COLES hereupon treated the subject in an exhaustive manner. Each stage in the processes dealt with was practically illustrated; many negatives being considerably altered by the treatment. At the conclusion it was decided, owing to the lateness of the hour, to defer discussion on intensification until the next meeting.

A discussion on reducing the density of negatives followed.

Mr. W. E. DEBENHAM preferred ozone bleach to common chloride of lime, a saturated solution of the latter not always being definite, there being also a tendency to deposit lime in the film; ozone bleach would not do this. Its composition was not precisely known, but it contains more chlorine than bleaching powder. It is also very useful in removing the last traces of hypo in order to intensify.

The CHAIRMAN preferred the reducer the lecturer gave preference to.

Mr. A. MACKIE enquired if perchloride of iron and hypo had been tried; did negatives so treated alter in the light? Also what action takes place between protosulphate of iron and hypo? He found if the latter is in excess, no reducing action takes place. With iron in excess and the addition of an acid, reduction is considerable.

Mr. DEBENHAM found that negatives altered with permanganate of potash were liable to change in the light; he could not say whether a persalt of iron would prove more stable.

Mr. HENDERSON admitted that any acid would remove pyro stain, but the same would reappear after prolonged washing; he succeeded very well with ozone bleach. When it became necessary to reduce a negative, he much preferred his method with cyanide of potassium; this he could recommend as a powerful reducer, also as a means of obtaining clear shadows when it was desired to intensify, there being no risk of frilling as in the case of all acids and ozone bleach.

The CHAIRMAN remarked that all gelatines will bear the application of ozone bleach; he saw Mr. Cobb reduce an exceedingly dense negative by means of it.

Mr. W. COBB was surprised to hear of frilling with ozone bleach after a negative had been dried. If the gelatine was of a soft nature, the addition of alum would stop frilling.

Mr. BURTON had met with some gelatines so hard that they will not frill when strong hydrochloric acid is poured over them.

Mr. W. M. ASHMAN, in reply to the lecturer's query *re* reducing by abrasion, said he frequently reduced gelatine negatives locally with cuttle fish bone and finely pulverized resin.

The CHAIRMAN then called on the Lecturer to reply.

Mr. COLES, in reply to Mr. Debenham, said it was true ozone bleach was a purer compound than chloride of lime usually met with; but sufficient chlorine is obtained in the latter to act on gelatine films. Some gelatines are harder than others, and the proportions given may require regulating; if anyone finds the solution is not strong enough, they can make it stronger next time. With regard to Mr. Mackie's question, he would not hazard an opinion on the compound which might be formed. He had noticed a darkening action on the film after the plate had been reduced with perchloride of iron; also a similar action after the use of chloride of copper and hypo. He found Mr. Farmer's method much better than either of the others. Speaking on the action of acid and iron referred to by Mr. Mackie, he had a great objection to putting hypo on a plate containing acid, or an acid when hypo is present, because sulphur is deposited in the film. This was instanced by the experiment of mixing alum, acid, and hyposulphite of soda together in a test-tube. Replying to Mr. Henderson, he said, if much lime were present in the water, the colour may return. Soaking in distilled water would be found to answer. He had tried the cyanide method, and with great care, it answered very well; it was free from frilling. So, also, is the ferridcyanide of potassium method, which acts slower, and is more under control. Replying to Mr. Burton's experience of gelatine resisting strong acid, he said the difference in gelatine was very great; he found some gelatines would not stand any acid, ten per cent. hydrochloric converting an image into chloride, which could be removed in the fixing bath: the same remarks also applying to ferrous oxalate developed negatives.

The CHAIRMAN, in moving a vote of thanks to Mr. Coles, said that the strict attention which had been paid to his remarks was the best evidence he could have that his efforts were fully appreciated.

A hearty vote of thanks having been accorded,

The nomination of officers for the ensuing year then took place.

The election and annual meeting will be held on the 26th inst

HALIFAX PHOTOGRAPHIC CLUB.

THE usual monthly meeting of the Club was held on the 10th inst., Mr. T. BIRTWHISTLE in the chair.

Mr. Councillor JOHN SMITH gave a practical demonstration of the Stannotype process of Messrs. Woodbury, Treadway, and Co. The great simplicity of all its working details, and the beauty of results, at once commanded the admiration of all present, the unanimous verdict being that a great future lay before it.

A vote of thanks was passed to Mr. Smith for his very exhaustive lecture and elaborate preparations.

The thanks of the Society were heartily accorded to the patentees for the kind manner in which they had responded to Mr. Smith's invitation to send samples illustrating the mode of working their process.

THE POSTAL PHOTOGRAPHIC SOCIETY.

THE annual general meeting of this Society was held on the 16th inst., at 3, Plowden Buildings, Temple.

Dr. HORACE DAY having been voted into the chair, and the minutes of the previous meeting read and confirmed,

The HON. TREASURER reported as to the progress and position of the Society, and handed in a statement showing a balance of £16, which, however, is forestalled for prizes of competitions now in circulation.

The question of appointment of an hon. secretary was then brought forward, and it was unanimously resolved that Mr. W. M. Baylis be elected Hon. Secretary and Treasurer, and that a sum of 3s. a week be paid by the Society for assistance in the secretarial work, and for pasting the prints into the albums, &c.

The vacancies in the committee, caused by the resignation of Messrs. Pocock, Senier, and Cowley, were filled up by the following gentlemen being elected in their stead:—Messrs. Harris Heal, J. C. Cohen, and Dr. H. A. Roome.

After some discussion upon the present system of competitions, it was unanimously resolved that in future one album per month (at least) should be issued; that there should be two prizes, one of 10s., and one of 5s., awarded to the two best pictures in each album; and entrance fees for the competitions should be abolished.

In order to stimulate the production of various classes of photography, Mr. Bankart's suggestion was adopted—that every alternate album should be composed of pictures of some one particular class, such as land and water subjects, portraits, interiors, architecture, &c., and the dates and subjects of these special albums were decided upon for the ensuing year.

On the motion of Dr. Day, the Hon. Secretary was requested to convey the thanks of the members to Mr. Pocock for his services connected with the initiation of the Society, and also their great regret that his connection with it was about to terminate.

After some general conversation the meeting dissolved.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting was held on Tuesday, June 10th, at the Masonic Hall, Mr. Councillor FIRTH in the chair.

A large number of members were present, there being a very attractive programme for the evening—viz., the pictures and talk on the trip to Dove Dale, and the pictures in competition for the subject composition of "A Rustic Bridge," two prizes having been offered by the committee: one for the best in half-

plates and under, and one for whole-plates and over. Many members took part in the competition, and a very beautiful variety of bridges were pourtrayed, yielding a pleasant and interesting exhibition for the non-competitors as well as for those who were competing, the collection embracing most of the picturesque bridges in the surrounding country.

The prize for whole plate and over was won by the president, Mr. Firth, with a very brilliant picture of the rustic bridge at the entrance to Dove Dale.

Mr. Thos. Hibbert took the prize for half-plate and under with a very carefully selected and interesting representation of the wooden foot bridge near Rivilan Paper Mill.

Many of the views were beautiful and highly creditable, and in one or two instances ran very near the winners in the ballot-box.

Mr. H. RAWSON showed a stereo picture of fine manipulation and poetic subject.

Mr. B. WOOD exhibited an enlargement (not for competition) by the Autotype Company from a negative of a rustic bridge in Padley Wood, which called forth great praise.

Mr. T. S. YEOMANS showed a beautiful cabinet vignette of rustic bridge, foliage, and rippling brook, carefully selected and rich in tone.

Mr. W. DAKIN drew the attention of members to the high qualities of a developer he had mixed and tried (which was some time ago published in the NEWS), and worked with great success on both in- and out-door pictures, but which he said was invaluable for out-door work and amateurs, as a protracted development did not stain the film, there being no ammonia in it. The formula runs thus :—

Carbonate of soda	125 grs.
Carbonate of potash	125 ,,
Sulphite of soda	125 ,,
Water	10 ozs.

Use pyro as usual to the respective sizes of plates, with enough of the above solution to flood with.

Mr. H. RAWSON brought a few dishes made by the Patent Pulp Company, which were white, and seemed very likely to be of great use in the art, having the requisite chemical resisting properties, along with durability and cheapness.

The subject of the next trip was then brought on, and Millers Dale was selected.

Mr. Drummond was elected a member.

The subject of Dove Dale and the views got there was then talked over, the trip having taken place on the 22nd of May. There were 13 cameras, and 112 plates of various sizes were exposed. Plate after plate in quick succession received its charming imprint, and many were the expressions of hope that all would come out right. We must say that many have been gratified.

Mr. Thos. Firth, who worked the whole length of the Dale with a whole-plate camera, is well paid for his trouble with some excellent pictures. Mr. Taylor also succeeded in getting some choice views. Mr. H. Rawson, armed with a new stereo fit out, picked out some charming bits of river, rocks, and trees. Mr. W. B. Hatfield worked a long range lens on whole-plates, and was very successful. Mr. Dakin and Mr. Milward left the party with the object of varying the collection of pictures, and Mr. Dakin got five 10 by 8 negatives from choice positions, and with such success that leaves nothing more to be desired. Through some accident with Mr. Milward changing his box, his work was spoilt. Messrs. Turner, Wood, Pilley, Mittersham, and Pearse, all brought home some lovely things, and, taking one thing with another, the day was one of the best we have ever had.

ST. HELEN'S ASSOCIATION FOR THE PURSUIT OF SCIENCE, LITERATURE, AND ART.

Photographic Section.

A MEETING of this Section was held on May 28th, Mr. HEATHER in the chair.

The Association held its first field-day at Knowsley Park on May 11th. The photographers, favoured by splendid weather, were busy all the afternoon taking views of the hall, grounds, &c., with cameras ranging in size from 7½ by 5 up to 12 by 10. A large number of prints and negatives of these views were shown at the meeting, and much admired.

Mr. BROOK exhibited a number of mounted prints of woodland scenery at Upholland, taken with his 12 by 10 camera, but each had a light spot about two inches diameter in the centre, which somewhat marred the picture.

Mr. TAYLOR exhibited a transparency 7½ by 5 of an exceedingly pretty rose-coloured tone which he attributed to a finely-divided deposit of silver, which view was shared by most members present. He intended trying to get the same tone again, and, if possible, to reduce it to a method of working, as it would be a very effective tone for autumn scenery lantern slides.

Mr. BROOK asked for information as to the best method of packing plates for safe carriage after exposing, as he intended taking a trip to Canada and the United States, America, this summer, and did not intend developing till he arrived home. A number of plans were brought forward, but all appeared to have some defect, taking up too much room, rubbing, &c. [Will any reader kindly oblige by giving a few hints on a plan he has tried ?]

A communication from Mr. Sherlock, entitled "Printing in Colours," was read (see page 391).

A discussion then took place on the process, but was adjourned until the members had tried it.

The meeting shortly afterwards closed.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next meeting of this Society will be held on Tuesday next, June 24th, at eight p.m., in the Gallery, 5A, Pall Mall East.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—We are requested by Mr. F. A. Bridge, Hon. Secretary and Treasurer of the above Society, to announce that, in future, all communications should be sent to his new address, East Lodge, Dalston Lane, London, E.

THE PHOTOGRAPHIC SOCIETY OF IRELAND has made arrangements for the holding of an exhibition—the first of the kind, it is stated, in Ireland. The exhibition will be held in November next in the Royal Hiberuian Academy. Medals will be awarded for artistic and scientific excellence, but the judging will be conducted on a different plan from that adopted by the Photographic Society, as the adjudication will be placed in the hands of the members generally, after the method adopted at the Edinburgh Exhibition.

PHOTOGRAPHY AS A MEANS OF OBTAINING PATHOLOGICAL RECORDS.—From the other side of the Atlantic we receive the following of the pen of Dr. A. L. Cory :—"As to the use of photographic outfits in medicine, I would say I find mine a great benefit. I have used it in cases of skin diseases, small-pox, spina befida, &c., and can see now where I should have kept photos of many cases if I had possessed it before. While in charge of Lake health department I took frequent copies of small-pox cases. It is so little trouble to keep the plate-holder filled and the camera in one corner of the consultation room. A photo of any case can be had at a minute's notice, the plate to be developed when convenient. I frequently take mine in the buggy when called to a case I think may be interesting, and use it if opportunity offers. Nothing that I know of offers us so easy and accurate a method of recording interesting cases."

A NEW CORK.—The accompanying drawing shows one of Mr. Kingzett's new patent corks. It is described, we believe, as the "reversible distributor cork." The one half is grooved, so that

when this portion is placed in a bottle or flask containing any liquid, and the bottle or flask inverted, the liquid escapes down one or more of the grooves. The cork is both a stopper and a sprinkle. It is so simple, cheap, and effective that it will have a large sale, and we commend the novelty to chemists and perfumers.—*Burgoyne's Magazine.*

PHOTOGRAPHIC CLUB.—At the meeting on June 25th, the adjourned discussion on "Printing-in Skies" will take place. The Saturday afternoon outing at North End and West Heath, Hampstead. Meeting afterwards at 6.30, at the "Bull and Bush."

To Correspondents.

*** We cannot undertake to return rejected communications.

W. J. B.—1. An excellent plan is to soak the recently-fixed negative in Cowell's clearing solution—alum 1 part, citric acid 2 parts, and water 10 parts. 2. The ordinary camera is not long enough, so you must arrange some kind of lengthening attachment. 3. Unless you tell us how you prepare it, we can hardly suggest a probable cause. It sometimes happens that hard water is used, this occasioning the formation of a white precipitate.

G. F. W.—The address will be found on page 365.

E. RICHARDSON.—You should endeavour to break up the lighting a trifle by screening a portion of the skylight towards the two ends. Still, your pictures are good ones, and will compare favourably with much of the work sent from the fashionable glass rooms into the retouching department. The large head would make an especially good picture if skilfully retouched.

DOUBTFUL.—Nothing is better than good gum. Select a sample which consists entirely of clear and whitish molecules, which are full of minute cracks, and make a mucilage of about the consistency of castor oil, taking care to free this from suspended matter by squeezing it through very closely-woven muslin. It is well to add a little carbolic acid, say about three drops to each ounce. The brownish and transparent pieces which are often found in cheap qualities of gum, frequently swell up and gelatinize without completely dissolving.

PETER ROMMER.—1. Nitric acid will dissolve out the reduced silver, and the unaltered haloids left in the film will form a positive picture, which of course may be rendered very intense by any one of the reducing agents commonly used in developing. 2. We are inclined to think that you will waste money by having it repaired, and that to buy a new one of modern construction will be the wiser course. 3. There is not much chance of obtaining Daguerreotype plates now-a-days, but you can easily obtain such copper plates as are prepared for the use of the engraver, and it is easy to get these electro-silvered. If you take a walk along Wilderness Row, Clerkenwell, you will be able to find a place where electro-plating is done for the trade. 4. It is not sufficiently strong; try equal parts of the acid and water.

BEGINNER.—You have evidently bought one of the cheapest cameras in the market—in fact, little more than a toy. We do not like to adviso you to cast it on one side, and to buy a more expensive instrument; but such advice would be good. First see that the position of the plate exactly corresponds with the plane of the ground glass, and for this purpose you can easily make a guage to rest across the outside of the slide and focussing frame respectively. Next test your lens to see if it works to focus, using a number of cards set up one behind the other like the "risers" of a staircase, for the purpose. You should focus the middle one, and if this comes out sharpest in the picture, the correction of the lens is perfect; if not, one of two courses is open to you: either alter the position of the ground glass in its frame, so that the card which was actually the sharpest in the picture shows with most distinctness on the focussing screen, or determine the error of the lens and make a correction each time you take a picture. For this purpose, you must notice how much the sliding tube of the lens mount must be moved in order to bring that card which was sharpest in the picture, to the best definition on the ground glass, and after having focussed a picture, you must shift the lens to this extent, but in the contrary direction. Neither of these methods is theoretically perfect for all distances, but either is good enough in actual practice. Always write if you think we can help you.

F. A. G.—1. We prefer the pyrogallic developer in such a case. 2. An article on the subject will be found on page 226. 3. You will find the information on our last page.

PRINTER.—It seems to us as if the albumen surface has been corroded or partially dissolved, and this may arise from the use of a solution containing too much alkali. 2. Try an acetate or lime bath.

CAMERIST.—Galvanized iron is not by any means a desirable material to use, and we should prefer to use zinc, although this latter is open to objection. The lead or "compo" pipe is not likely to do any harm.

CHLORIDE.—The exact proportion is not a matter of very much importance, but we have used three parts of hydrochloric and one of nitric. Take care not to overheat the mixture while the gold is being dissolved, or you will lose the greater part of the chlorine.

B. HARRISON.—We cannot judge without knowing more; it is only natural that you should take such a view.

J. D.—1. The varying hardness of the gelatine is the principa reason, but something depends on the conditions under which the bromide has been formed. 2. Not as far as our own experience goes. 3. Certainly, if you wish to do the work in the same time; otherwise you can use the weak bath in the latter case. 4. Yes. 5. We think not, unless very great pressure was put upon them to induce them to adopt the uniform system.

AMATEUR.—(Preston).—1. If you guard against moisture in films your trouble will cease. 2. We have never known a cure, and look on the matter with much doubt. 3. Full information will be found in the present number. 4. Write to the office for particulars. 5. In ordinary cases it may be made up to a volume of five fluid ounces, but rather under than over. 6. It is very much better to use fresh albumen.

H. FOLKHARD.—From your description we suppose it must be the panoramic apparatus of Sutton, but we do not think it possesses any commercial value at the present day.

J. J.—1. Either your bath is too weak, or there is too much iodide in the collodion. To add silver to the former or plain collodion to the latter is your course. Perhaps it may be well to do both. 2. All light acts on a gelatino-bromide film more or less; indeed, there is no such thing as a "safe light."

W. G.—Such a course of action would be despicable, whatever the legal aspect may be.

DOUBT.—You are by no means the first who has been troubled in the same kind of way, and we think the best course would be to tender the unopened package to the manufacturer, and ask him to give you others for them. If he refuses, obtain what you require elsewhere, and send him the bill. After having found a portion defective, you are not bound to risk your work by using the remainder.

LEX.—The film on the paper is collodion, as it readily dissolves in a mixture of alcohol and ether. Doubtless it is a collodio-chloride print.

ONE IN A FIX.—Unseasoned wood has doubtless been used, and the instrument is likely to give much trouble. Scraping and the application of black-lead may somewhat improve matters, but do not use the scraper too freely.

ENGLISHMAN.—We quite understand your feelings, but we simply record the facts.

P. S. F.—There has evidently been a scum on your printing bath, and before sensitizing you should carefully skim the solution with a piece of folded blotting-paper.

The Photographic News Registry.

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1317.—*June* 27, 1884.

CONTENTS.

THE REMOVAL OF FATTY MATTER FROM GELATINE.

THIS question, which a few years ago had but little interest except for the few who were engaged in working bichromated gelatine processes, has now a direct bearing on every-day photographic work.

In the last number of the *Bulletin* of the French Photographic Society, we find some notes by M. Scola, which are of considerable interest, as throwing light on one of the most troublesome defects to be met with in gelatino-bromide plates.

M. Scola says:—In examining layers of dissolved gelatine, evenly spread over glass plates, I have noted that such solid bodies as dust, filaments, hairs, particles of bromide of silver or insoluble salts, can alone be fairly retained in the mass of the gelatine during desiccation; but soluble bodies, such as crystalline salts, tend to be eliminated from the mass, and to crystallize on the surface of the dry film. At any rate, this condition of things holds good unless the saline substance enters into combination with the gelatine, as alum and a few other salts are known to do. It struck me that oil or fat ought to be expelled from the surface of films of gelatine on drying, just as other substances are expelled which do not form a true combination with the gelatine; and experiment confirmed this view. Indeed, I found many sheets of gelatine are greasy to the touch, and even so much so as to grease blotting-paper, with which they are wiped. Such sheets of gelatine were washed with bisulphide of carbon, and on evaporating the liquid, an appreciable residue of oily fat was obtained. The practical outcome of these experiments is the observation that gelatine may be conveniently freed from fatty matters by immersing the sheets or flakes in benzole of good quality for a few minutes; then shake out the adherent liquid, and finally rinse them in spirit. Any ordinary solvent of fatty matters, such as ether, bisulphide of carbon, or benzoline, may be used in a similar way for the removal of grease from gelatine.

The method of clearing flakes of gelatine from fatty matter here recommended by M. Scola is an excellent one, and we have recommended something of the same character to our readers. Instead of benzole, it is both convenient and economical to employ benzoline of good quality instead of the expensive benzole, and it is scarcely necessary to say that the so-called methylated spirit should be used for the final rinse, and not pure alcohol. It is well, however, to bear in mind that the liquid sold as "methylated finish" contains a certain proportion of resinous matter in the solution, and for this reason ought not to be used. It may be noticed that methylated spirit cannot be purchased in larger quantities than a gallon at a time without a permit from the Excise authorities, while the methylated finish can be obtained without restriction at almost any oil shop.

The presence of greasy matter in gelatine not only prevents the adhesion of the film to the glass, but also gives rise to the production of surface markings and irregularities of various kinds. It is easy to understand how the presence of grease can break up the surface of the film, as when a portion of fatty matter is eliminated upon the surface as indicated by M. Scola, the cohesion of the gelatine is destroyed in this particular place, and the retractive force of the film generally serves to draw some of the still elastic gelatine away from the weakened parts of the film. Anyone who carefully watches the formation of pits and map-like markings on the surface of gelatine as it sets, cannot have a doubt that such markings arise from the lowering of the cohesive strength of the gelatine in certain parts.

It is to be feared that ordinary commercial gelatine will always contain traces of greasy matter, at any rate, unless the whole system of manufacture is changed; hence the above mode of purification becomes of importance.

LANTERN SLIDES.

FIFTH ARTICLE.*

OUR fourth article explained the formula and method of making a collodio-bromide emulsion; we will now treat upon a collodio-chloro-bromide emulsion, which has given the utmost satisfaction in our hands. The introduction of a *chloride* into emulsions is by no means a novelty; but it is not generally practised, even among *gelatino*-bromide workers. Those who have successfully introduced chlorides into gelatine emulsions have rarely discontinued the addition, as there are several marked advantages accruing from the presence of a chloride in conjunction with a bromide; and it is this very circumstance that tempted us to work out a formula for a collodion emulsion which should include chloride as well as bromide of silver.

In collodion emulsion making, unfortunately, the number of haloids available is somewhat restricted, much more so than in gelatine emulsion work, owing to the insolubility of many of the haloid salts in either alcohol or ether. Some are quite insoluble, whilst others are only soluble in the presence of so large a percentage of water in the alcohol and ether employed as to make these solvents almost useless for collodion emulsion purposes.

It is, above all things, necessary to keep down the quantity of water that must, perforce, find its way even into a collodion emulsion; and especially does this apply when it is intended to employ that emulsion by using it up at once as an *unwashed* emulsion, because an undue pre-

* Reference to previous articles, vol. xxvii., pages 129, 291, 482, and 818.

ponderance of water in the emulsion will give rise to crapy lines or structure in the films. Hence we urge what ought to have been mentioned in the last article—viz., the use of solvents of low specific gravity, and of haloids soluble in alcohol and ether, and also the *minimum* of water in making the alcoholic solution of nitrate of silver.

In *zinc bromide* and *cobalt chloride* we have two salts soluble in alcohol, although both are also deliquescent at ordinary temperatures, and these are the haloids we use in making our

Collodio-Chloro-Bromide Emulsion with Free Bromide.

Quantities.

Pyroxyline (Hopkins)	48 grains
Absolute alcohol	4 ounces
Ether, methylated (·725)... ...	4 ,,
Zinc bromide (dried at 212° F.)...	100 grains
Cobalt chloride ,, ...	5 ,,
Nitrate of silver	150 ,,

Employment.

Into a suitable 10-ounce, wide-mouthed, clean, dry bottle (with a nice soft cork), place the 48 grains of cotton, and pour thereon the 4 ounces of ether, but only 2 ounces of alcohol. When the cotton dissolves, weigh out the zinc bromide and cobalt choride, and shoot them into the bottle, and shake until dissolved. If the solvents are pure, the cobalt chloride will dissolve in blue streaks. Make the alcoholic solution of the 150 grains of silver, as directed in the last article—*i.e.*, by putting the said 150 grains into a small boiling flask with about 20 or 30 drops of distilled water, boiling it over a spirit lamp until solution takes place, and then cleverly getting 1 ounce of alcohol in without causing the silver to separate in flocculent crystals.

At the risk of repetition, we place some stress upon this operation. It is really a very nice little bit of chemical manipulation which the learner in photographic chemistry would do well to practise in order to acquire the knack of producing an alcoholic hot solution of nitrate of silver. Let the silver solution boil before adding it, drachm by drachm, to the collodion; each addition will make the surface ether in the bottle boil, but that is of no consequence. Shake between each addition of silver vigorously, and get the whole of the ounce of alcoholic solution of silver in within two or three minutes, corking between each addition, and making each addition at the boiling point of alcohol. A splendid, rich, and creamy emulsion will be the result. The whole now lacks one ounce of a solvent—alcohol—to bring it up to the orthodox thing for eight ounces of emulsion. If the formation of the emulsion goes right, and there is no indication of precipitation, this final ounce of alcohol may be added as soon as the silver has been safely got in. The method of employment here set forth has for its object to leave the emulsion minus this ounce; in fact, if the bottle be graduated it will be found to be about an ounce and a-half short—the half ounce is evaporated ether, caused by additions of boiling alcohol—so that the experimenter would do the right thing to see that if the eight ounces are to be made up scrupulously, there should be ether added as well as alcohol. The formula is framed so that six grains of cotton shall be present in the complete ounce of emulsion—there are actually eight grains per ounce present when the silver is about to be added—this is all intentional. It is more facile to form the emulsion in a strong collodion; a weak collodion will not hold up the chloride; a strong collodion permits of being afterwards brought down to any degree of creamy or milky condition of the emulsion desirable; whereas a weak collodion which is just on the verge of precipitating its "load" of silver haloid cannot be "stiffened" up so readily as the converse operation. Emulsions made with zinc bromide have a very awkward trick of precipitating the silver bromide, for reasons not exactly known.

Further, it is probable—yea, very likely—that the experimenter will elect to leave it at seven ounces, by merely adding half an ounce of ether when the emulsion is cool. We have timed ourselves from the moment of sitting down before the scales to compound this emulsion, and from the moment that we commenced until the said emulsion was complete, barely half an hour had elapsed before we had got a quarter-plate glass, and had coated it and immersed it in our washing tray (to free the film from the salts of decomposition), and after a few minutes' washing we have exposed the plate in the camera and developed it: and this was done whilst the emulsion was actually *warm* from the act of adding the hot solution of silver! We have more than once regulated the condition of emulsions made as just described by adding thereto *plain* collodion made from other cottons. Some proved old and rotten, a year in solution, and of two or three grains of such cottons per ounce of solvents. It will thus be seen that the employment at first of a strong collodion has many advantages.

The resulting emulsion is of grand quality: it gives good rich, creamy films, tough withal, partaking not of the skim-milk, sky-blue quality, we have seen so often.

This emulsion, containing chloride of silver, is quite four times more rapid than one made without the chloride; that the chloride is actually present in the films can be abundantly proved if it were necessary. It ripens quickly, develops easily, gives very clean, robust images when developed with—

Pyro	1 grain
Bromide	¼ ,,
Ammonia...	1 minim
Water	1 ounce

and, despite quick gelatine plates, we firmly believe that there is much to be done with collodion yet, in the way of making it rival gelatine in rapidity; not that rapidity is essential for films for lantern slides, but rather as proving the theory that the first impact of light can produce an effect upon a sensitive surface, which is thence entitled to be called rapid or slow accordingly as to whether that image can be developed easily or the opposite. At any rate, a given film, which will receive a readily developable image of robust quality, with a minimum of light, must surely be entitled to be called good.

A PHOTOGRAPH FOR THE PRINTING-PRESS.

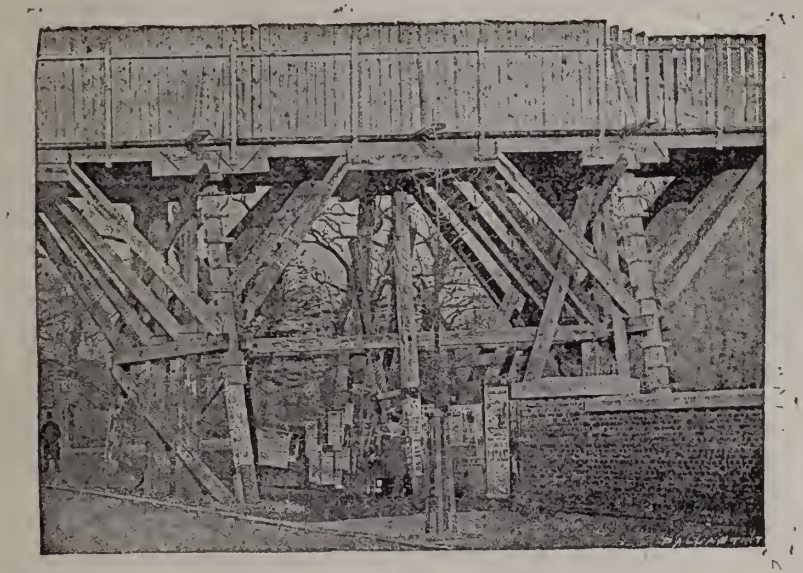
"This photograph will show you the exact condition of the clumsy structure," says a correspondent, who has long felt himself aggrieved at the presence of a delapidated wooden bridge which was allowed to remain, year after year, close to his residence in the Finchley Road, but which has been removed during the past few weeks. A glance at the photograph sent shows one that it is not of the usual kind, for it is on a metal plate, and this metal plate is mounted upon a piece of wood, so as to bring up the total thickness to near about an inch. Every detail of the subject can be clearly distinguished on the surface of the metal; but to get a good view you must hold it in a particular position with regard to the light, just as is the case with a Daguerreotype; indeed, at first sight, it does not look very much unlike one of Daguerre's pictures, only it is less vigorous, the clear, smooth parts being hardly so bright and mirror-like; while the dull and clouded portions are certainly not so white.

It is easy to see that those parts corresponding to the black shades of the original stand out a very little in relief, certainly not much more than the thickness of the paper upon which the PHOTOGRAPHIC NEWS is printed; but still the relief is clearly perceptible, especially as the high parts are smooth and unbroken; while those portions of the picture corresponding to the lighter shades of the original subject lie somewhat below the general level, and are broken up into a number of little points or grains. These granulations of the surface give the whitish appearance

which characterises the high-lights; but between the two extremes of smooth metal standing a trifle in relief, and the numerous clearly-outlined, but minute ridges and vales which form the whitish stipple, we can trace portions where the grain or stipple becomes shallow and indistinct, and, indeed, all intermediate grades between the rough and smooth.

All is clear now: our correspondent has sent us the kind of photograph of which we can best make use. It is a typographic block, which may be printed from in the ordinary letter-press; indeed, we should have known this earlier if we had read our friend's letter to the end, as he tells us that the block was made in a couple of days by Mr. Dallas, the original negative having been sent. Let us borrow an inking roller from the printer, and ink the face of the block; we find that the smooth and very slightly-projecting parts take the ink freely enough; while very little adheres to the deeply-stippled portions, or only to the tips of the granulations where the metal comes in contact with the printing roller.

"How may such a block be made?" the reader will ask. But we must reply that, as far as Mr. Dallas' method is concerned, we do not know, for this gentleman works his method as a secret process. The results, however, do not very much resemble those obtained by such recently-introduced methods as those of Ives, Meisenbach, or Zuccato, but correspond more nearly in appearance to work obtained by the Pretsch method, of which we gave an example on page 386 of our last volume; and as an excellent account of the process was published by Mr. T.



PATENT OFFICE LIBRARY

Ryley in 1858 (Journal of the Photographic Society, page 161), we cannot do better than to reprint this, with the remark that the nitrate of silver need not be added, and by "fine glue," must be understood such a gelatine as that of Coignet. Mr. Ryley says:—

1. I dissolve 1 ounce of fine glue in 3 ounces of distilled water, and to 1 ounce of this solution I add 30 grains of nitrate of silver, previously dissolved in ½ ounce of distilled water; to the other 2 ounces of glue solution I add 2 ounces of a saturated solution of bichromate of potass, and while warm I add to it the nitrate of silver and mix well.

2. I level a glass plate and pour over it as much of the above solution as will, when quite dry, form a film about the thickness of thin writing paper.

3. I now expose the plate to sunlight under a glass positive for about three hours, or until all the details of the picture appear when viewed by transmitted light.

4. I then wash it under water until those parts of the picture which are the least acted on by light become granulated, which is caused by a peculiar contraction of the film; the superfluous moisture must then be removed by blotting-paper.

5. You may use a negative instead of a positive, but your exposure must not be more than half the time, and you will still have a positive result, and the grains of your film will be much finer. And now let me remark that in this granulation lies the whole secret of the process; and yet, strange to say, not one word can you find respecting it in the specification, and therefore I contend that all patent right is justly forfeited.

6. A mould in gutta-percha is then taken from the film and rendered conductive by plumbago or other means, and put into the electrotype apparatus until you have a deposit of copper of sufficient thickness to form a matrix, from which you can deposit a thick copper plate strong enough to print from.

The progress and condition of engineering works have often been recorded by the camera; indeed, we may mention that twenty-nine years ago, the great railway bridge across the Dnieper, at Kiew, was being constructed by Mr. C. Vignoles. Each day a photograph was taken and forwarded to the Czar.

Our correspondent has, however, struck out a new path in photography; and although we quite sympathise with him as regards his years of fear lest the bridge should have tumbled about the ears of himself or family, we see no particular advantage in placing the condition of the once-existing bridge on record in our paper, except as an instructive illustration of a field of usefulness for photography.

His idea of writing a letter of complaint to a newspaper, and sending a typographic photograph or printing block illustrating his views, is an excellent one, and it seems to us that the police authorities might well take the hint. What, indeed, could more effectually assist in the discovery of criminals who are "wanted" than a publication of phototypic portraits in the *Police Gazette*? Col. Dillon, the successor of Mr. Howard Vincent, will doubtless consider the matter.

By-the-Bye.

BAD PHOTOGRAPHS.

The Greek cynic who has the credit of being the first to clearly promulgate the doctrine that "the majority are bad," may possibly have taken a very high standard of virtue by which to judge the general mass of mankind, or more probably, he wilfully shut his eyes to the good points of human nature, and brooded so much over the bad

characteristics of mankind as to acquire an altogether abnormal power of referring each action to some mean and evil motive.

That it should be possible to apply this doctrine, that of the badness of the majority, to the productions of the camera, is a supposition altogether repulsive to our feelings, and indeed we would like to view the existence of a bad photograph as being an impossibility; but if we were to shut our eyes to all defects, and to regard the work of the Sun's pencil as the British workman regarded malt liquor when he exclaimed, "There aint no bad beer; some beer is better than other beer, but there aint no bad beer," we might perhaps lay ourselves open to a charge of prejudice in the other direction.

Is it not worth while just for this once, to try to put ourselves into the most cynical frame of mind, and to try our best to say all the unpleasant things we can?—for by so doing we shall clear off all the spleen which may be lurking around, and put ourselves into a frame of mind to take a more kindly view for the future.

Where, then, are the bad photographs to be seen? Everywhere. In the shop-windows, in the show-cases, in our friends' albums, among the cherished collections of amateurs, and even at the Pall Mall Exhibitions. About the time when gelatino-bromide plates first came into general use, we well remember an occasion when some dozen persons were gazing at a frame containing pictures of a boat-race, and nearly all were loud in their expressions of admiration and wonder at the perfect outlining of the curly vapour of the steam-boats, and the wonderful delineation of the ripple on the water, when an amateur, who had never been to the Exhibition before, and who knew no one in the room, suddenly turned to a high dignitary of the Photographic Society, and in a half-whisper said, "But are they not vile photographs after all?" "They are," was the answer, "but you are the first who has said it." The pictures were really bad photographs; flat, without depth, absolutely lacking detail in the shadows, and bare in the lights.

Bad instantaneous photographs of races and processions are offered freely for sale in the shops, but the public do not buy them; to the photographer they are of very great interest, and he accordingly judges them leniently; but the public at once estimate them at their just value—as bad photographs. There have been good pictures taken of boat races, horse races, and street processions, but they are few and far between:—"The majority are bad."

Perhaps the very worst photographs to be seen in London are some of those used by auctioneers and house agents to set off their announcements of desirable villas or eligible residences—such faults as distortion owing to the tilting of the camera; painted-in clouds roughly corresponding in form to the outlines of trees or buildings; roofs and streets white as if after a snow-storm; or an extreme flatness and weakness, leaving the subject hardly distinguishable at a distance of a few yards, being common enough. To criticise work of this kind too severely would be ungenerous, as it is generally done at the lowest possible prices, and by men who not only can ill afford to devote sufficient time to the work to obtain good results, but who have often to make shift with extremely defective apparatus. The same sentiment prompts us to say but little about the bad ferrotypes and glass pictures which are made by our humbler brethren at places of public resort; and although the doctrine that the "majority are bad" certainly does apply with full force to this class of work, really good and artistic pictures may now and then be found among the collections of the travelling portraitist; and, indeed, it may be said, to the credit of more than one of our best workers with the camera, that he has raised himself to his present position from a beginning made on the sands at a seaside resort.

The amateur very often makes bad photographs, and, what is more, it not unfrequently happens that he is extremely proud of them. "All these were taken at the outdoor meeting on Saturday last," is not an uncommon remark to hear at a photographic gathering, while a series of bad slides is being passed through the lantern. Trees which might have been cut out in black paper with a scissors, and large patches of shade where one looks in vain for the shrubs and rich foliage which one knows to have existed in the locality, are common. "And this is the gem of the series," loudly shouted an exhibitor of bad photographs as one of the least objectionable examples of the previous Saturday's work was revealed to a not very delighted assembly. And yet this exhibitor would have been the very first to detect and denounce a bad picture, bad anyone else shown it.

This leads us to make a distinction between such as make bad pictures almost by necessity, as in the case of the photographer who makes prints at a painfully low figure for house agents, or the humble craftsman who takes ferrotypes in the street, and the amateur who should have no inducement to allow anything but good work to go beyond the confines of his work place.

Francis Bacon discourses of ignorance, and he indicates two kinds. When a person is ignorant, and he knows it, the ignorance is "simple," and some improvement may be hoped for; but when the ignorant person is not aware of his condition, the ignorance is described by Lord Verulam as "compound," and a cure cannot be hoped for until the ignorance has been reduced to the "simple" condition; or until, to use other words, the ignorant person ceases to regard himself as learned.

Just so in the case of photographs; any notable improvement being improbable until this producer of bad photographs shall learn to recognise them as bad.

The very highest art photographers, men whose names immediately recal the idea of something near perfection in photographic work, produce abundance of bad photographs, but they recognise them as bad, and destroy them immediately; and this is how it comes about that they maintain their reputation. The work of an artist-painter can be laboured upon and altered to an unlimited extent; a bad painting may be made a good one; but this is not so with the photograph—the only remedy is destruction. As soon as the exposure is made and the development has been fairly commenced, it becomes possible to judge whether the picture is good or bad—whether it should be preserved or destroyed. The most skilful opticians make many bad lenses, but those instruments which cannot be made good by a re-grinding of the curves are ruthlessly destroyed by those who value their reputation; and the more rigidly photographers follow in the same path, so much the less will be the probability of our again endeavouring to force ourselves to take a cynical view, and to preach from such a text as "The majority are bad."

NOTES FROM NEW YORK.

PROGRESS OF THE NEW AMATEUR PHOTOGRAPHIC SOCIETY—NEW MODIFICATION OF THE PYRO DEVELOPER.

THE widespread interest in photography upon this side of the Atlantic among amateurs continues unabated. The ranks are swelling to large proportions, and it will not be long before the young man, the man of pleasure, and a large portion of the fair sex, will be found carrying a small camera whenever they go upon a vacation.

Manufacturers are studying to secure lightness and strength in cameras or other apparatus, to encourage the increasing demand, and it will be difficult to tell where they will end. Americans, as a general rule, prefer anything which is light and strong.

The membership of our new young amateur society, "The Society of Amateur Photographers," has increased one-third within two months, so eager are the amateurs to learn and compare results; its success is secured, and its future is bound to be bright. The opening of the new permanent quarters of the Society, 1262, Broadway, on June 4th, was celebrated by a lantern exhibition of slides made by

amateurs. The exhibition was a success in point of interest and in the work displayed, and the lantern was well managed by Mr. G. W. H. Johnson, of Bridgeport, Conn., an amateur of some note. Several of the slides were made by him upon collodio-bromide, and also wet plates. Mr. Brush furnished some of the finest slides shown, these being made upon albumen gelatino plates, developed with oxalate and iron. To many old amateurs these were a great surprise, on account of their remarkable brilliancy and clearness, and will no doubt encourage many to make them.

The Society has fitted up a special dark-room with sinks, lockers, and other conveniences for the use of members and for experimental purposes; it also has a library filled with all the modern works and current literature on photography. Each member is entitled to the use of these at their leisure at any time. It is expected this feature of the Society will become quite popular, as many members residing in the city are obliged to put up with very poor substitutes for a dark-room. The room is 18 feet by 7, and is arranged with double doors, has a peculiar system of ventilation devised by the President, and will afford facilities for half-a-dozen members to work at a time. By a vote of the Society, all members of amateur societies in other cities, whether here or abroad, will have the privilege of using the society's dark-room free of charge for a brief period, when in this city.

The last regular monthly meeting of the Society was held on June 10th at their hall in Broadway. Mr. Beach, the chairman, congratulated the Society upon securing such a well-located hall, and hoped that his efforts to found and start the Society would be seconded by others in giving to members the results of their valuable experience. Several interesting communications were read, including letters from the Editor of the PHOTOGRAPHIC NEWS, and Mr. S. Fry, the Kingston dry-plate maker; and resolutions were passed, thanking the Scovil Manufacturing Company, Messrs. Anthony and Co., and others, for favours shown.

The interesting feature of the evening was a new formula given by Mr. H. J. Newton, for preserving pyro in solution, the advantages being that the acid of itself acted as a developer, and not as a restrainer, this being of much importance in the development of instantaneously exposed plates.

His formula is as follows:—

No. 1.

Water	32 ounces
Granulated carbonate soda ...	3 „
Carbonate potash...	3 „
Sulphite soda	3 „

No. 2.

Water	12 ounces
Concentrated formic acid ...	12 minims
Pyrogallol...	48 grains

To develop an instantaneously-exposed 5 by 8 plate he takes ¾ of an ounce of water and adds a ½ ounce of No. 1, and 1 ounce of No. 2, which makes a bulk of 2 ounces. The developer thus made contains approximately 25 grains of potash and soda combined, and 4 grains of pyro. For a longer exposure, he reduces the potash and soda one-half or more according to the requirements. So far as his present experiments have been carried, he finds 1 drop or minim of formic acid will preserve 4 grains of pyro.

He stated that he had kept the solution a long time, and believed the developing power of the pyro would not deteriorate as in other preserving agents.

Mr. Pearsall, of Brooklyn, had a gentleman to explain his new compact camera for amateurs. The model shown had a movable front with focussing screw as in many English cameras; the back was adjustable to any angle like a swing back, and had a bellows hood attached for focussing to avoid the necessity of taking one's hat off or using a cloth. In place of the ground glass was a screen of silk, which in an instant could be wound up out of the way on a spring roller. Very thin single plate-holders are used, made of a light wood frame covered by paper. Upon one side of each slide was printed the word "Exposed." When the plate is put in, the blank side of the draw-shutter is out, but after the exposure is made, and the slide is pushed home, the printed side is out; in this way mistakes of double exposure are prevented.

The meeting closed with a brief exhibition of lantern slides, and proved quite interesting to all present.

During the summer several field club excursions will be made to take landscape views for the benefit of the Society and members. The first trip has been planned to embrace the fine scenery on the Hudson in the neighbourhood of West Point. A steam yacht is to be hired, which will land at various points and afford the party excellent facilities for displaying their artistic talents.

Experiments are soon to be inaugurated towards a careful test by experienced men of all American gelatine plates; it is expected some months time will be required, and when published the results will probably be of much value.

THE AMATEUR PHOTOGRAPHER.

New York, June, 13th, 1884.

THE SPECTROSCOPE AND ITS RELATION TO PHOTOGRAPHY.

BY C. RAY WOODS.

X.—PHOTOGRAPHY IN NATURAL COLOURS.

IN a series of articles on the spectroscope, to make no mention of the subject of photography in natural colours would be a grave omission, for spectroscopy has played an important part in the investigation of what little has been done in this direction. The writer does not profess to add anything new in this direction, but it may not be amiss to re-state, in as clear and simple a manner as the subject will allow, what has already been said and done.

There are several ways in which this question is regarded in the photographic world generally, extreme opinions being adopted, as on most debateable subjects. One view is that taken by the optimist, who hopes that the time will come when he can get a photograph in the colours of nature with all the ease with which he manipulates a dry plate and takes a silver print. Another view, quite an antagonistic one, is that the idea is altogether the dream of a visionary, and that its realization is out of the question. Most photographers, perhaps, take a view midway between these two, and while regarding the discovery of what may be called "the philosopher's stone" of photography as by no means unlikely in the very distant future, do not expect that the "transmutation of the baser metals into gold"—as the transition of black and white to natural colours may be likened to—is to be obtained without some trouble on their part. Such a view is a perfectly reasonable one. Separating the true from the false, the genuine work of the patient experimenter from the quackery of the mountebanks who bring the subject into disrepute, enough has already been done to forbid us to entertain the notion that the seeker after photography in the colours of nature is pursuing an *ignens fatuus*. On the other hand, what little success has already been achieved, and the pains with which that little success has been obtained, only serve to make clearer the immensity of the task.

Experiments have been made in two distinct directions: 1st. In obtaining a picture by a direct process; 2nd. By taking into consideration the three-coloured pigment theory of the artist.

In connection with the first of these methods the names of Edmond Becquerel and Niépce de St. Victor are most prominent. Both these investigators, and others who have worked in the same direction, have taken as their basis the sub-haloid salts of silver, the subchloride producing the best results. The method preferred by Becquerel, of producing the subchloride of silver, was to take a silver plate and immerse it, facing a similar plate of platinum in a bath,

of hydrochloric acid. By attaching the silver plate to the negative pole of a battery, and the platinum plate to the positive pole, a film of sub-chloride of silver was formed on the silver plate. By placing this plate in the camera of the spectroscope and allowing a brilliant spectrum to fall upon it, the colours of the spectrum were impressed. Niepcé de St. Victor photographed some dolls dressed in coloured cloths, by this method, using, of course, a very bright light and giving a very long exposure.

Various other methods have been used to obtain the sub-chloride of silver, amongst others being the plan of immersing a silver plate in a solution of chloride of iron, copper, or calcium. If silver chloride be formed on paper, or films be prepared of chloride of silver emulsified in collodion or gelatine, and these films be then exposed to white light till they become lavender grey in colour by the production of the sub-chloride, they will receive the colours of the spectrum upon them.

Two explanations have been put forward to account for the colours of such images: 1st. That they are due to different stages of oxidation of the silver salt; 2nd. That they are due to interference of light, as in the beautiful display of colour from soap bubbles, the thickness of particles forming the film determining the colour. Probably both explanations are correct, the second being the outcome of the first. Unhappily, all attempts to fix these photographs have failed. They may be kept for a long time in the dark, and may be examined from time to time in a weak light, but exposure to a strong light blackens the film and obliterates the image.

So far as actual results are concerned, the method about to be described has, so far, turned out most successful. Three investigators thought out the process simultaneously, but only one of them—Ducos du Hauron—had put his thoughts into practical shape. The method depends, as already stated, on the painter's three-colour pigment theory and practice. Three monochromes—red, yellow, and blue—printed on carbon tissue, are superposed. Husnik suggested an improvement on the process by substituting mechanical printing for carbon printing, thus rendering the necessary registration easier of accomplishment, in addition to simplifying the operations. This was carried out successfully by Albert, of Munich. The negatives were obtained by taking three photographs through green, blue, and red glass respectively; but it must not be imagined that this has any relation to the three-colour sensation theory of Young, Helmholtz, and Maxwell. When an ordinary photograph is taken, a negative is first obtained, from which the print is got. In obtaining a negative for printing in colour, not only must it be a negative so far as light and shade are concerned, but it must be a negative in colour also. For instance, if a negative were obtained through glass that only let through red rays, objects of a red colour would appear black, and objects reflecting no red light would come out white. If this negative were used for obtaining a print on red carbon tissue, those parts of the print which were beneath the black portions of the negative would come out white, instead of red, exactly the reverse of what was required. To obtain a negative for printing the red monochrome, glass of the complementary must be in front of the lens or the plate.

In Ducos du Hauron's process, therefore, the negative for printing the red monochrome was obtained through green glass, the yellow through violet glass, and the blue through orange glass. In fact, as we do not meet either with pigments or transparent media that reflect or transmit light of one wave-length only, to obtain a perfect result, the transparent medium used for making a negative should transmit all rays except those reflected from the pigment in which that particular negative is to print. The whites of the view or painting photographed would appear black in each negative, and would consequently appear white in each monochrome, and therefore in the three monochromes superposed.

It is many years now since this method was described and put in practice. The most serious difficulties encountered were in photographing through red and green glass. So many improvements have been made since then, the methods of photographing any part of the spectrum by means of dyed films, and the greater facility in photographing the red, either by collodion or gelatine emulsion, that it is about time we heard something more of this process than we do. It is a most ingenious method of obtaining colour-photographs, and might be largely applied.

So far as obtaining photographs in natural colours by a direct method is concerned, we are at present far from its accomplishment, but it is in this direction, most probably, that we must look. It opens up a large question. When an image, capable of fixation, is obtained in natural colours by a comparatively short exposure, our difficulties, perhaps, will only have begun. The proper representation of light and shade, detail in the shadows, &c., are matters that at the present time require constant attention on the part of the photographer. Who knows but what, when colour-photography seems within our grasp, strictly analogous questions will come to the fore with fiftyfold complications that the representation of colour must inevitably bring?

OUT AND ABOUT WITH THE TRICYCLE.

BY J. B. B. WELLINGTON (TEMPLE BICYCLE CLUB).

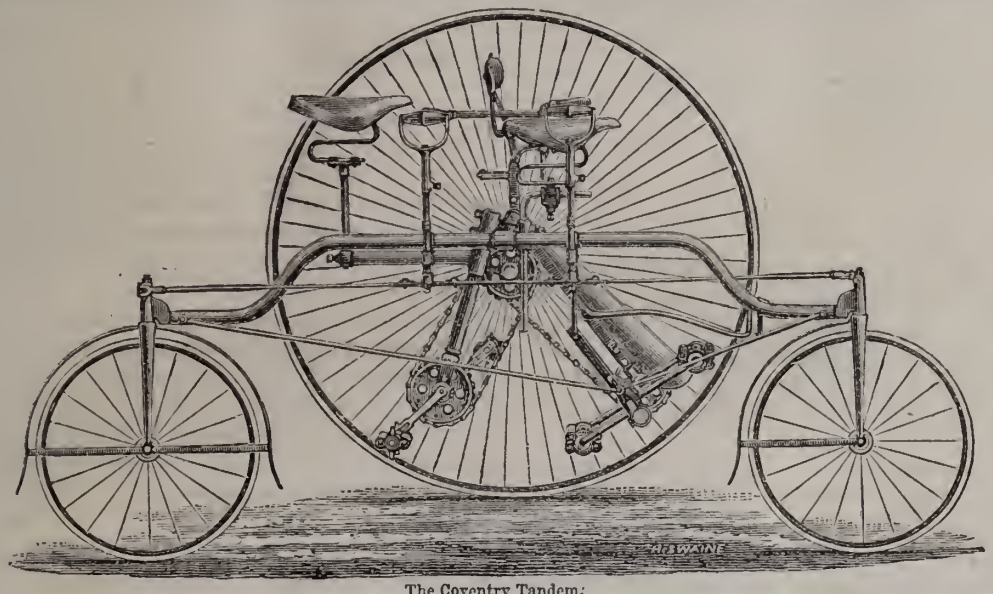
Now that you have opened your pages to tricycling in connection with photography, I think if everyone who combines photography with tricycling were to give their views and experience on what they consider the best tricycle for the purpose, that the would-be photo-tricyclist would be greatly benefited, as what is more perplexing than scanning through the advertisement pages of a cycling paper to decide—out of the hundred and more

The Coventry Rotary.

machines—"which one shall I go in for?" But after reading the experiences of others I think he ought then to be in a good position to decide on what "mount" to purchase.

I, for my own part, strongly advocate a "Coventry Rotary," made by D. Rudge and Co. I have now ridden one for over two years, and would not change for any other. In the first place, it is a very light machine,

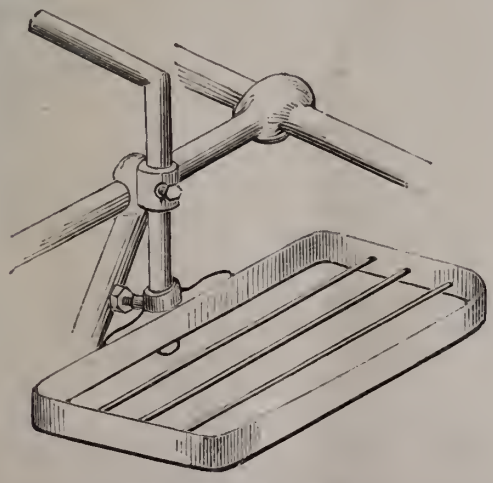
weighing 70 lbs., and is very compact, the width being only 30 inches, so that it will pass through any ordinary doorway; moreover, it will save one a good deal of discomfort if at any time you should want to take it by train. I remember, during last summer, I was riding with a friend who had a double-driver front-steerer, and it coming on to rain we thought it better policy to take train to our destination than getting wet. We forthwith found the station, took tickets both for ourselves and the machines, and the train having arrived in due time, I managed, without any difficulty, to get my "Coventry Rotary" into the guard's van; but my friend, on trying to do the same, found it quite another matter, the machine being too wide to enter. One of the wheels was then taken off, and another attempt made, but again proved fruitless; the axle caught in the hinge of the door, and now refused to go either in or out. In this state the train started, my friend hanging on outside, and the guard, inside, trying to pull it in. The bad language that was used over this I should not like to repeat. The station-master, observing what was up, stopped the train, and whilst taking off the other wheel, wished to know if we were going to keep the train all night. We then got the tricycle in, and proceeded on our journey. I do not wish you to think that all guards' vans are of such small dimensions. This is not the case; but you may drop across one as above when least wanted, as it is not always convenient or safe to have the machine sent on by another train.



The Coventry Tandem.

I also use the "tandem" tricycle, made by the same firm, the machine taking either two riders.

I will just give a brief outline how to carry the camera and stand, and this latter need not of necessity be a folding one. I find that one of George Smith's Brattice stands is very convenient for carrying on the machine,



Luggage-carrier attached to tricycle.

and is certainly both strong and light; it should be strapped to the long bar which connects the two steering wheels, and is then quite out of the way. When going on a tour, a fishing-rod will not be found to be of any appreciable weight, and certainly it is not in the way, as it can be strapped alongside the stand. Of course this applies to those photographers who take an interest in the "gentle art." Now for the heavier part of the kit. I have a carrier made of a light iron framework, and which can be purchased from Messrs. Starley and Co., manufacturers of the "Salvo" Tricycle. I think the price is 3s. 6d. This should be fixed as shown on the lower part of the ⅂ pin, which supports the saddle, as it is then easily taken off when not required. Below the carrier I strap on a basket containing a change of clothes, as well as a supply of plates; and on top the camera is placed and fastened by two large straps, which go round the basket below, also round the cross-piece of the framework, thus preventing the liability of the carrier giving way. On account of the "give" in this carrier, the vibration communicated to the camera and plates is reduced to a minimum, thereby preventing dust from shaking off the interior of the dark slide, and settling on the sensitive film.

I usually carry one dozen half-plates besides the four double dark-slides ready charged, for a two or three days' tour; but if on a tour of a week or fortnight's duration, the best way is to send a parcel of plates on by train to a place which you intend reaching in two days' time, as enough will be taken "on board," as suggested above, to last during the time the rest are in transit, so that no anxiety need be felt about their getting to their destination in time. They certainly should be labelled "Photographic Plates—not to be opened;" otherwise the vigilant railway authorities—just at present, at least—may, from their heavy nature, take them to be dynamite.

The tricycle lamp is the rider's guiding star by night, and indeed everyone ought to carry one both for his own and others' safety; certainly no photographer should omit to take it, as without any trouble it can be turned into a

most effective dark-room lamp for changing plates at night, by simply wrapping round it a piece of golden fabric, this being kept in place by an elastic band. A better developing lamp certainly could not be had.

About the 'Cyclists' Touring Club and its benefits I will leave someone else to treat more fully; suffice it to say that the subscription is but 2s. 6d. per annum; the chief advantage being, that on entering a town, you look through your hand-book and see at a glance which is the C. T. C. hotel, this being then at once made for, knowing at the same time you will not be "rushed," as a fixed tariff has been drawn up for the C. T. C.

After all, what is more exhilarating to both body and mind than to enjoy the fresh country air, to be spinning noiselessly along, no anxiety in hurrying off to catch a train, no travelling expenses, no horse to keep, and always ready at a moment's notice, and to get at the most out-of-the-way places, bringing home views which will never be forgotten, at the same time developing your muscles, which require no hypo to fix?

Notes.

It is worthy of note that the judges of the Photographic Exhibition of 1884 will, as last year, be composed wholly of photographers. This decision would seem to confirm the opinion already held, that some of the awards conferred where the judges were selected from painters as well as photographers, were not wholly satisfactory.

It is still considered quite *de rigueur* in convict prison circles that all prisoners should leave their cartes-de-visite with the Governor at the expiration of their stay. There is an exchange of "pasteboard," in fact, the convict leaving his carte, and the Governor presenting him with a "ticket of leave" in exchange. That this custom may be duly kept up, the House of Commons will be asked to vote, during this session, the sum of £850, which it is estimated will defray the cost of photographing the inmates in the prisons of England, Ireland, and Scotland.

Some months since we referred to the case of an American convict who, at the supreme moment, seized the sitter's chair and smashed the camera actually in use. Led, perhaps, by the force of this example, a recalcitrant inmate of Dartmoor, watching his opportunity whilst being taken the other day, suddenly "went for" the operator with a spade, which had been foolishly left within his reach; but luckily the prison authorities had supplied themselves with a second camera, which a warder quietly manipulated whilst a colleague was ostensibly focussing the convict with the apparatus hitherto in use. As it turned out, the ruffian, who was pounced upon just in time to prevent him doing the intended mischief, was photographed in the very act of raising the spade, and the resulting portrait was indisputable, though not exactly legal, evidence of his contemplated assault. The carte is, however, carefully preserved, and will probably always be pointed out as the most "striking" likeness the prison cameras have produced.

The sum of £850 already mentioned is not the only amount directly voted by Parliament for photographic purposes. A sum of £760 is also put down in the Army Estimates for photographic chemicals, apparatus, and working expenses; whilst the vote for Science and Art Department includes an item of £1,000 to be devoted to the photographing of art objects, &c., for loan to local museums and exhibitions. Thus altogether upwards of £2,700 of the tax-payers' money is devoted to what may be fairly called "negative" results.

The reduction of the price of magnesium has oftentimes been promised, so we do not look with absolute confidence on the statement that the Schering Chemical Company in Berlin will soon supply it at about 3s. 6d. an ounce.

Photography has always been a stumbling-block to the criminal, and Dr. Belfield, of Chicago, tells us how a murderer was convicted mainly upon photo-micrographs of blood stains; while in another case, the chain of evidence was completed by making enlarged photographs of the machine marks on two hair pins.

A "Society Journal," which, seemingly hard up for subjects for its weekly puzzle, offered a prize for the best novel suggestions, has, from one contributor, received the proposal that it should give the prize for the most original pose for photographic "sitters." Should a prize be really offered, the resulting pages of "Specimen" answers ought to furnish some useful hints. We shall look out for them.

Photographic work is fairly provided for in the new Observatory on Ben Nevis. The building, although in use, is not quite complete, and the dark room is a kind of cellar at the bottom of the tower.

Not a few clergymen gather in funds for charitable purposes by selling their own photographic productions at prices which are generally over the market value of the pictures; and as long as there is neither a serious neglect of the legitimate work of the church, nor much competition with trade interests, few are likely to complain. At any rate, it seems much better that the clergyman who longs to outstep the confines of his calling should become a quasi-amateur photographer, than that he should—like a well-known clergyman of Kensington—parade the streets as a kind of unprofessional barrel-organist.

Might not paper manufacturers turn their attention to the wants of photographers a little more than they do? Mr. Spiller, at the May meeting of the Photographic Society, drew attention to their shortcomings in the production of photographic cards as regards the presence of hyposulphite. The manufacturers of albumenized paper, it is well known, find a great difficulty in procuring suitable material in the English market, but foreign makers are ahead in this respect, and, having no competition, practically have a monopoly in their hands. This is not as it should be.

Two fatal accidents from the careless handling of chemicals took place on Monday. Mr. Reid, of Manchester, died from inhaling the fumes of nitric acid; and Mr. Griggs, a pyrotechnist of Wisbeach, was killed by an explosion which took place in his laboratory. Those who make pyroxyline, or use Bunsen batteries, should remember that many fatalities have resulted from the inhaling of nitrous fumes.

How to obtain vigorous images on gelatine plates is a question of the day, although few people candidly admit their difficulties in this respect.

Mr. Sebastian Davis has studied the subject, and he finds that the main point is to increase the proportion of bromide in the developer, and to allow more than the usual time for development.

There is nothing whatever novel in such a suggestion, but this takes nothing from its practical value. Two grains of bromide of potassium to one drop of ammonia is not too much in many cases, and the use of such a developer does not make the plate slow, if a reasonable time be allowed for development.

"The development of plates is a science, but I can teach any one to make them," remarked Colonel Stuart Wortley at the meeting of the Photographic Society on Tuesday. There is much truth in this idea, and it will doubtless give comfort to those photographers who use commercial plates, and have to bear the sarcastic remarks of others who are fortunate enough to have leisure and convenience for habitually preparing their own.

General "Chinese" Gordon is, we have heard, a practical amateur photographer, and as there was certainly one photographic apparatus, with all due appliances, in Khartoum at the time of its investment, it may be assumed that he has had it removed to "the Palace," and finds in it an invaluable aid for passing the time. To "take" the rebels' camp and the heads of the enemy every day, even in a photographic sense, must be a great deal better than nothing.

The photographing of the series of portraits of Popes in the Vatican Gallery having been completed, it is said in a Roman paper that permission has been given by Leo. XIII. for the reproduction and publication of the valuable historical paintings contained in the same vast storehouse of Art. The reproduction, too, by photo-zincography of its more interesting and historical paper and parchments is to be commenced forthwith.

At the last meeting of the Royal Astronomical Society, Mr. Ranyard read a paper on "The cause of the blurred patches in instantaneous photographs of the sun." These patches are attributed by M. Janssen to solar clouds above the photosphere: these, he supposes, change very rapidly. Mr. Ranyard, however, believes that the patches are caused by currents of heated gas, and supported his views by experimenting with a piece of hot iron suspended within the telescope. The photographs of the patches so produced were exhibited, and elicited from Mr. Common an enquiry as to the width of slit used, as too narrow a slit gave rise to diffraction fringes. On its being stated that the width was $\frac{1}{8}$th of an inch, Mr. Common observed that he thought the slit must have been narrower. "No doubt," he went on to say, "with perseverance very bad photographs can be got, but the important question is how to get good ones." The learned society of astronomers laughed at this remark, but there is much truth in it. Some experimenters never get beyond the bad photograph stage.

The *Court Journal* says of the new so-called *repoussé* work—the metalization of plants—that it has one drawback which in the eyes of many of the fair sex will be fatal to the prosecution of this new industry—it soils the hands, the chemicals used for metalising having much the same effect on the fingers as photographing has. The *Court Journal* is behind the times; we have long since passed the age of blackened fingers.

Chicago photographers just now are terribly exercised in their minds over the competition which is cutting down prices everywhere and ruining the profession. The State of Illinois Photographic Association lately discussed the matter solemnly, and it was decided that each member should hand in a card on which should be stated what the writer would do if the Society as a whole decided upon raising the prices. But if it be true, as one member stated, that the people were getting disgusted with cheap photography, and that those men were busiest who were getting the highest prices for their work, there would seem to be little need of discussion, since the matter had practically settled itself.

Incidentally, it was mentioned that a Mr. Decker, of Cleveland, had raised his prices to twelve dollars per dozen for cabinets, and, in consequence, his trade had improved. In spite of this we fear few English photographers who find their business decreasing will have the courage to try the experiment of asking £2 8s. for a dozen cabinet pictures.

We are glad to be able to assure our readers that in the arrangement for next year's Exhibition, photography has not been overlooked, and we may state that in the official classification, which is now almost completed, photography will have a group to itself.

Opportunity will be afforded for exhibiting apparatus of every sort, illustrations of processes, and examples of the application of photography to all the various purposes for which it is now used. As the show is to be confined to "apparatus, appliances, processes, and products, invented or brought into use since 1862," it will be understood that pictures will not be admissible, except as illustrations of processes; but since almost the whole science of modern photography has grown up since 1862, it is evident that the limits of the Exhibition will not press hardly upon us.

We hope that the executive will recognise at once the interest and the importance of the art, and that sufficient space will be afforded for complete illustration of its present condition. We also trust that manufacturers, inventors, and amateurs will all avail themselves of the opportunity. Next week we expect to be in a position to publish the details of the classification, and some other particulars likely to interest our readers.

The Chemical Society now possesses a nearly complete set of portraits of the past presidents—these pictures having been printed in carbon—and they are hung in the council room. Dr. Russell, who has done most of the work of making the collection, wisely insisted on admitting no silver prints.

Although silver prints often last as long as need be in a family album, a society or club collection of portraits in silver may be regarded as well-nigh valueless.

The Secretary of the 'Cyclist's Touring Club has, we are told, an album with more than seven hundred portraits of the members, and fresh contributions are coming in at the rate of about twenty per week. How many of these—if, indeed, any—are permanent photographs?

It is perhaps not generally known that when a faded silver print is copied by means of the camera, it is often possible to obtain an impression of much detail which has become invisible to the eye; and if a print is copied when the first evidence of fading becomes noticeable, a really good negative can generally be secured.

Alcohol, so long regarded as capable of remaining fluid at the lowest temperature, may, it appears, be frozen at about —130° Centigrade. Boiling ethylene was used as the cooling agent in this case, and a temperature of —136° may be reached. Still lower depths in the scale of coldness may be attained by the use of boiling oxygen; the point of ebullition of oxygen being estimated by Cailletet and Pictet at —186°. When this temperature is reached, nitrogen can be readily liquefied under pressure, and by allowing the liquefied nitrogen to boil off rapidly, a portion solidifies in beautiful snow white crystals. A degree of cold is thus reached at which the main gaseous constituent of the atmosphere actually becomes solid.

Mr. Woodall, M.P., at a recent meeting of the Polytechnic Institute, spoke very highly of the system of teaching as carried on in the class-rooms at Regent Street. He said:—"I have not seen such a practical system anywhere on the Continent." Mr. Woodall may well speak with authority on this matter, and our readers will remember that the photographic class is under the direction of Mr. E. Howard Farmer. Out of six first-class prizes awarded by the City and Guilds Institute, no less than five were taken by Polytechnic students.

Patent Intelligence.

Specification Published during the Week.

5204. HARRISON GARSIDE, of the City of Manchester, in the County of Lancaster, Photographer, "An improved method of producing surfaces for mechanical or ink printing by means of photography."—Dated 2nd November, 1883.

This invention consists of an improved method of producing surfaces for mechanical printing by means of photography, and the object of my invention is the production, by mechanical and chemical means, of surfaces for mechanical or ink printing, and it is applicable to typographic, lithographic, and plate printing, and to the printing of fabrics by means of rollers. Its leading feature is the breaking up of natural tints, or photographic reproductions of the same, into dots or lines of varying magnitude. This I effect in such a way that the so-called lights of the object to be represented are translated into minute dots or lines, and the shadows into dots or lines of such magnitude, and at such a distance apart, as almost to represent actual blackness. One of the ways in which my invention can be carried out is as follows:—I produce a grained plate or mould by cutting or punching, in a flat metal or other plate, a series of shallow recesses of conical form, and having their edges in close contact. From this mould I produce, by the method known as Woodbury-type printing, a transparency on glass, or thin paper, using such a mixture of fluid gelatine and pigment as will give absolute opacity at the extreme depth of the mould. I now copy this transpareney in the camera on a suitable scale, to give the grain desired in the printing block or plate. This grain may be conveniently varied to suit the different classes of work and printing. This copy, which consists of dots of absolute transparency shading into absolute or nearly absolute opacity, may now be duplicated in any of the usual ways, and, for convenience, in the form of films. If one of these grained films, or screens, be now applied to the face of an ordinary photographic negative, it will be found, on examination by transmitted light, that the more opaque portions of the negative are now absolutely impervious to light, except in the form of minute spots, while the more transparent portions or shadows are veiled by a tracery of lines which, by suitable printing, may be nearly obliterated in the further operations; while, between these extremes, the varying tints of the negative are seen as spots of varying dimensions. From the negative so adapted a photo-lithographic transfer may be made and transferred to stone, or to a zinc, or other plate, if an etched surface for block printing be desired. If a surface for plate or *intaglio* printing be required, the operations are the same, using, in this case, a photographic positive and reverse mask. For certain subjects, such as portraits, and in cases in which it is desirable to make improvements by hand, either mechanical or artistic, after the translation to grain has been made, it is convenient to make an enlarged picture from the photographic negative and the grained film combined. From this enlargement, after the needed improvements have been made, a grained negative may be produced on the scale required. I do not confine myself to the use of shaded dots in working my invention. For some subjects, such as the representations of machinery, statuary, and coins, shaded lines may be conveniently substituted, or a combination of two or more screens composed of shaded lines may be used as a substitute for the shaded dots. The grained plate or mould may also be produced in various ways. For instance, a less mechanical translation may be made as follows:—An exposed collographic plate is to be inked up with a tint approaching blackness, and a grained resist transferred to a metal plate, or a similar transfer may be made by means of the grained paper which is in use by lithographic artists, or in other ways. The plate may now have the conical grain produced by repeated etchings as practised in typographic block work. In some cases it is convenient to produce the grain on the photographic negative, in the first instance, by placing in front of the sensitive plate while exposed in the camera a grained screen, or by exposing the sensitive plate before or after exposure in the camera to the action of light under a grained screen, and in this case the exposure in the camera may be somewhat reduced.

My invention may also be carried out in the following way. I expose a piece of sensitive carbon tissue under a negative, and, after development, I support it on a surface of soluble gelatine, and, while still slightly soft, I lay it upon a hard metal plate having the V-shaped grain, and subject them to sufficient

pressure to force the gelatine into the recesses of the plate, and I so proportion the thickness of the gelatine relief that the grain of the plate is entirely filled by the thickest portion of the relief when dry. I now dissolve the soluble support, and produce a printing plate by electro deposition, or in any other convenient way. Or a piece of ordinary carbon tissue may be exposed and developed in the usual way, and transferred to a white surface thickly coated with colourless gelatine, or other slightly ductile material. While still in a softened condition it is to be placed in contact with the hard grained plate, which may be waxed to facilitate removal, and subjected to the necessary pressure. After drying, the picture is to be removed, and it will be found that the tints are broken up into dots of varying dimensions in proportion to the varying thickness of the relief picture. From this picture a negative in black-and-white may be made, and a block, or other printing surface, produced by the usual means. Instead of using a mask or screen consisting of shaded dots or lines, a mask composed of transparent dots or lines on an opaque ground may be used in the following way. The mask is to be placed at an appreciable distance from the face of the negative which may be in contact with the surface to be impressed, and such a combination of direct and diffused light is to be thrown upon the mask as will cause the rays to disperse to an extent equal to very nearly the pitch of the dots or lines before reaching the sensitive surface.

Having thus described the nature and object of my said invention, I declare that what I claim and desire to be secured to me is :—

1. The method of breaking up the tints of a photograph into positive dots or lines of varying dimensions by means of masks or screens consisting of shaded dots or lines substantially as described.

2. The method of filling up the grain of a plate by means of a gelatine relief for use as described.

3. The method of breaking up the tints of a gelatino-carbon or other relief picture by pressure in contact with a plate having a V-shaped grain.

4. The use and application of the above methods to the production of surfaces for ink and colour printing in all their branches substantially as described.

FRENCH CORRESPONDENCE.

Conference Organised by the Syndical Chamber—The "En-cas" Pocket Photographic Apparatus.

On June 16th the Conference was held at the *Hotel des Chambres Syndicales*, at which the actual state of jurisprudence in relation to photographic copyright was indicated, the numerous services photography renders to all branches of decorative art, whether engraving, sculpture, painting, or drawing, being also considered. Attention was drawn by me to the great use artists might make of the camera, and I recommended a study of photography not for the purpose of turning artists into photographers, but that they may have faithful records of any subjects or accessories they may require for their works. The recent misadventure of M. Dantan, previously narrated in the Photographic News, shows the necessity for artists having direct recourse to photography, instead of turning to account pictures taken by other people. I had in my possession the original photograph used by M. Dantan, and one of his pictures in the Salon, but had both been shown together on the screen they might have caused an unfriendly feeling. The vexatious part of it is, that a picture absolutely copied from a photograph is a work of art, while the ruling law refuses to consider the original photograph as such. At the end of the conference, in which more than 500 persons took part, the methods for simple and easy employment of photographic apparatus at the disposal of artists were shown. I exhibited and described successively, Germeuil Bonnaud's photographic opera-glass, Enjalbert's photo-revolver, Stebbings' automatic camera, the academy camera, of which two were sent by Marion and Co., and the photographic En-cas of my own invention, of which a full description will follow, as it is now offered for sale by M. Francais, optician, Paris. Next, lanterns by Molteni and Laverne were shown, for enlarging the small negatives, or for projecting on a screen with the view of better judging of their effect. Lanterns with petroleum lanterns with petroleum lamps are preferable to artists and amateurs, as they are easy to manage, and give excellent results when enlargements are required not exceeding 18 by 24 or 21 by 27 from negatives of 6 by 6 centimetres in size. If too much enlarged, all the imperfections not noticed in the original—such as want of sharpness, specks of dust, &c.—will come out, giving a result deficient in the qualities of a direct print.

The annexed diagram gives a complete idea of the *en-cas*

pocket photographic apparatus as now manufactured. The bellows camera, when closed, measures only 9 by 10 by 3·7 centimetres, and weighs 280 grammes. In front, on a slide running in grooves, F, is placed the rectilinear lens set in action by its instantaneous shutter. It is a circular shutter in the same place as the diaphragms, and set in motion pneumatically at D without causing vibration, The slide bearing the lens may be moved backwards and forwards by a rack. The back of the camera opens for the insertion of the dark-slide, shown in diagram at C, with the inner part removed. The dark-slide holds two plates, kept apart by the partition with spring. Pellicles and sensitive paper may also be used, placing them behind a clean glass so as to keep them in a state of tension. Each dark-slide, containing two plates, weighs 48 grammes; six, therefore, when filled would be from 288 to 300 grammes in weight with the case. The dimensions of each dark-box are 10 by 7 by 0·6 centimetres. The slide is drawn out underneath at C, so as to avoid the introduction of light. The stand is made of three tubes of brass, one fitting into the other. Three sockets connected by chains to a central ring permit of the stand being placed so as to give tension to the legs. The whole is enclosed in a cane, like a stout walking stick, the top, P, unscrewing to admit the three branches. At *m m'* is a brass rule fixed on a pivot *m*, taking a horizontal position, having a projecting knob at each extremity, serving as points of sight by which the objects may be centred on the plate without using ground glass. A little handle replaces the stand for rapid

exposures in the hand, as with a pistol. In such cases, the apparatus is held in one hand, the eye adjusts the picture in the centre by the two sights, and the other hand works the shutter by pressing the pneumatic pear, P. To sum it all up, three little parcels are put into one's pocket; the first is the camera, next the collection of six double dark-boxes, and the third is the lens with shutter and diaphragms complete. This last in its case weighs on 235 grammes. With the walking-stick in the hand is completed the photographic outfit, sufficiently reduced in volume and weight so as to be easily carried in the overcoat or coat pockets. Compared with all other apparatus of the kind, I think this is the most complete in point of portability, as well as the dimensions of results obtained—namely, 6½ by 6 centimetres. The question of solidity has not been overlooked, and the thickness of the wood and stoutness of finish render it not a mere toy, but a really accurate instrument. The lens is a double rectilinear, 10 centimetres focal distance giving sharp definition instantaneously of images 6 by 6 without any diaphragm, although having an opening of 12 millimetres. The shutter is a double palette, turning on a central pivot, M, where a steel spring bends it more or less. When the little crank, M, is vertical, the lens is exposed; when horizontal on the side opposite to that shown in the diagram, the lens is covered and ready to act. The exposure is as long as possible, as the one palette describes a semi-circle before that masking the lens exposes it to the light. This is equivalent to a circular shutter, the disc of which would have an opening equal to half the circumference. If pellicles were employed without glass, the weight of the dark boxes would be considerably reduced; but it is not worth while to give up this advantage for the sake of the trouble which would be otherwise caused by the difficulty of keeping the films at equal tension. It is desirable to make use of pellicles or paper, because a reserve stock can be carried about with very little additional weight. With the aid of a lantern with ruby glass, the pellicles can easily be changed at night. This seems a long talk on a small subject, but I beg you will excuse me by remembering that the smaller a photographic apparatus, the more it is necessary to study its mechanism to render it as good as possible.

LEON VIDAL.

THE VELVET ROLLER AND COLLOTYPE FOR AMATEURS.

BY SAMUEL C. RILEY.

IN using the velvet roller no particular precautions are needed, but the roller should carry enough ink of moderate thickness, consisting of pure olive oil and litho. transfer ink thoroughly incorporated. The greatest advantages accrue from first rolling the collotype plate with the velvet roller, covering the whole plate with a thin uniform coating, and immediately rolling the plate with a leather roller sparingly covered with the same ink as used on the velvet roller. Any amount of brilliancy can thus be obtained (providing the negative is perfect), always remembering that a little sharp rolling clears the whites effectively. I have repeatedly seen collotype plates that could not be inked up with the leather roller by itself (owing to the plates being dried badly), which gave perfect impressions after having been inked lightly all over with the velvet roller, the plate being cleared with a few gentle rolls with the leather roller.

To make a collotype plate that will give perfect impressions, proceed as follows:—

First, the substratum for the plate.—Take 1 ounce of ordinary dinner ale, 6 or 8 drops of silicate of soda, and well shake into a froth in a bottle, stand it by for twenty minutes, then filter. Take a clean glass plate (patent plate is best), and with a camels' hair brush go over one side of the plate; set on end to dry. When dry, go over the plate again, letting it dry this time the other way up. When again dry, let a gentle stream run on it for thirty seconds; then again dry on end. When again dry, you may coat with the following solution:—44 grains Nelson's ordinary gelatine soaked for quarter of an hour in cold water, then heated in the oven till all is melted. Then pour into it the following hot solution—

Water	½ ounce
Bichromate of ammonium ...	6 grains

Well mix and filter. On no account let the solution get to boiling point. Take an 8 by 5 plate with the dried substratum on it, and flow over it ½ an ounce of the hot gelatine solution; place at once on the levelled glass in the drying box. It should dry in two hours, and is ready for instant use. Expose under an ordinary negative for an hour, then wash in cold water for 1½ hours, and dry in the open air, which takes from 4 to 6 hours, according to the weather. When dry, damp with very weak glycerine and water, allow the moisture to slightly evaporate, roll as above mentioned, and take impression off at once.

The drying box is as under:—20 inches high, 12 inches square, the levelling glass about 6 inches from the top of the box, three sheets of loose blotting-paper lying on it for the plate to rest on, a piece of iron (say) 6 by 4 by 3 heated in the fire, and placed 6 inches under the levelling glass. There should be at least three or four holes at the bottom sides of the box, and three at the top, to promote a good draught. The heat in the box should be about 120° F.

Rebiew.

A B C DE LA PHOTOGRAPHIE MODERNE. Par W. K. Burton. Traduit par G. Huberson. (*Paris, Gauthier-Villars.*)

WE here recognise an old friend in a new guise. Mr. Burton's A B C has been so thoroughly appreciated in this country and in America, that we have no doubt the French edition will have a large sale. The translation is very well done, but here and there one finds such slips as the translation of "methylated spirit" by "alcool méthylique." M. Huberson showed his discretion in not attempting to translate Mr. Burton's allusion to methylated "finish;" he simply leaves it out. An author should always run through a book intended for translation, and annotate such points as may offer special difficulty.

Correspondence.

EXTREMELY SMALL DIAPHRAGMS.

SIR,—I am very glad to see that the question of very small stops is likely to be thoroughly ventilated. It is now more than two years since, in your issue of May 5, 1882, I pointed out the error of the then prevalent view that the physical effect of diffraction is injurious to definition, even with stops no smaller than any usually supplied. I deduced my results briefly and roughly, from observation rather than theory, and am now much interested to see how closely they agree with those of Captain Abney, who, making S=27″ with $\frac{1}{10}$ inch aperture, would make the disc of confusion subtend an angle of 54″. My estimate was 50″, which, if we are to take into consideration the three bright rings outside the disc, would appear decidedly too small. But, basing my calculation rather on observation than on theory, I feel inclined still to hold to my opinion then expressed, that, "as with points of intense light seen on a black ground this error is at its maximum, so in circumstances more resembling an ordinary photographic image, it is much less sensibly injurious." This seems to agree best with such experience as I have had in astronomical observation, in which it was often desirable to work with a smaller aperture on planets than on stars. I remember the astronomers in charge of Lord Rosse's telescope some twenty-

five years' since telling me that when observing the moon they frequently—nay, commonly—reduced the working aperture from six feet to twelve inches only, finding even then that the longer focus of the great telescope gave them an advantage over the smaller one of half its dimensions.

My estimate of accurate definition at $\frac{1}{200}$ inch, as compared with Captain Abney's at $\frac{1}{100}$, will not certainly be considered large. Much depends on whether we are thinking of the central or the marginal definitions, and on whether a swing-back has to be used to any great extent. Copying I look on as a separate question, concerning which I hope shortly to offer some remarks. But some ambiguity appears when Captain Abney refers to the case of a lens of twice the focal length first mentioned. I venture to think that when he says, "With twice this focal length it is evident that the limit (of safety) would be reached, since the total diameter of the disc and ring of light forming the image of any point of an object would be nearly $\frac{1}{100}$ inch," he is considering the stop as still $\frac{1}{50}$ inch, which would be $\frac{f}{200}$. It is well known that the error of diffraction is a function of the aperture without regard to focal length, and the expression for the value of S shows this. It does not, however, follow that the practical error diminishes when a stop giving the same intensity is used with a longer focus lens, though the absolute diameter of the aperture being greater, the absolute value of the error diminishes in the same proportion. For though this would apply to a telescope where absolute defining power is looked for, it does not apply to a photographic image, which is expected to be equally sharp on the enlarged scale of a long focus lens, as with a shorter one. And the rule is therefore demonstrable, that whatever be the focal length of the lens, a stop of *given intensity* will be accompanied by a *given error of diffraction.*

In my own practice I have frequently had occasion to use even smaller intensities than $\frac{f}{120}$, but I consider them as useful only with very large plates, or when an excessive use of the swing-back is required with an extreme wide angle. I do not consider them advisable for obtaining mere depth of focus, or to be ever called for with plates so small as 12 by 10. But in recalling instances where I have used stops as small as $\frac{f}{150}$ to $\frac{f}{160}$, and obtained results quite sufficiently brilliant, I think I am justified in repeating what I said two years ago, that, "If we can keep out stray light from the camera, secure it from tremor, and have time for adequate exposure, we need not fear diffraction, even with far smaller stops than those commonly supplied." If a copy can be printed in time, I will send you one of a statue out of a large negative which I took with a lens having the extraordinary focal length of over nine feet. The stop was about $\frac{3}{4}$, giving an intensity of about $\frac{f}{133}$. You will see that the image is quite sharp, though, being somewhat over-exposed in a flat light, it is delicate rather than vigorous. But few will require to use lenses of over nine feet focus. The reason in this case was the inaccessible position of the statue.

I think that perhaps, on the whole, the result of my experience agrees with Captain Abney's view, that intensity of light and time of exposure are not quite interchangeable; but, as he expects probably to have some more to say on the point at an early date, I shall look with interest for his further remarks. It must not be forgotten that this question has an artistic as well as a scientific side.—I am, sir, yours truly,

W. H. WHEELER.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

A MEETING was held in the Council Room attached to the Gallery, 5A, Pall Mall East, on Tuesday last, the 24th inst., Col. STUART WORTLEY in the chair.

The first point brought under discussion was the cracking of the surface of highly albumenized paper, and it was suggested that it had been noticed more especially during the time when the wind was in the east; but the general opinion seemed to be that it was merely a result of abnormal dryness of the atmosphere.

A note was now taken from the question-box, in which it was asked whether some connection might not be traceable between the period during which vision is persistent on the retina, and the best time for exposure in taking an ordinary picture of moving objects; and it was suggested that one-eighth of a second might perhaps represent the time in an average case. It also appeared that the writer of the note supposed that a similar fraction of a second represented an approximation to the time required for the impulse of sense to pass from the eye along the optic nerve to the brain.

Mr. WARNERKE pointed out how very much persons differ as regards the time required for the impression on the retina to vanish; and

Mr. W. H. HARRISON said that the determination of personal equations was a very necessary feature of the observing work at Greenwich Observatory, but that for the same individual the variation proved to be trifling, except in the case of illness.

Mr. F. COBB referred to the extreme rapidity of reflex action in some cases, the touch of a fragment of splintered glass against the eyelashes being often sufficient to determine the closing of the lid before the flying glass could reach the eye. In this case, not only must the primary impulse reach the brain, but the return impulse must also be sent in a time almost inconceivably brief.

Professor DONKIN said that it appeared to him that no connection whatever could be traced between the period of persistency of vision on the one hand, and the rate of transmission on the other hand, with the best time for so-called instantaneous exposures. The data upon which the time of exposure should be based are special, and depend on the nature of the subject.

Mr. GEORGE SMITH and Mr. SEBASTIAN DAVIS remarked upon the motionless appearance of moving objects when lighted up for an extremely short time, as by an electric discharge, the phenomenon being well illustrated during a thunderstorm at night, or when a rapidly-revolving wheel is illuminated by the discharge of a Leyden jar.

Mr. PECK called attention to the more or less generally-recognised fact that it is often possible to obtain more artistic results by a comparatively long exposure, than by an extremely short one; and

Mr. ADDENBROOKE spoke in a similar strain, and as an illustration, referred to a case in which Captain Abney had treated the same subject in two ways: first, with a "cap" exposure, and secondly, with an extremely short "shutter" exposure; the picture produced in the former case proved to possess artistic qualities which were wanting in the latter.

The CHAIRMAN said that a main point arising out of the discussion was whether the camera could be expected to depict a moving scene with a finer definition and greater distinctness than the eye sees it.

The general opinion seemed to be that under favourable circumstances the camera is a far better and more exact observer than the eye.

The question-box being again looked into, an enquiry as to the cause of green fog was found, and the Chairman invited remarks.

Mr. BOLAS said that Mr. Plener and others had demonstrated that in ordinary cases it was due to a deposit of metallic silver; and in some cases, this deposit could be dissolved off by mercury (see account of Mr. Plener's experiments on page 235 of the PHOTOGRAPHIC NEWS for 1882).

Mr. WARNERKE said that on one occasion he put a developed and washed plate away with another glass resting against it and partially covering it. After about eighteen months, the uncovered part became somewhat iridescent, and its condition was such as to suggest that something like green fog had arisen. Another instance of a similar character was also spoken of. A film picture (collodion) had been partially varnished, and the dense silver deposit had become greenish and iridescent where the varnish had covered it. Mr. Warnerke appeared to think that the gelatine plays an important part in the production of green fog, and the action of the atmosphere has considerable influence. He referred to the well-known action of the atmosphere on the edges of packed plates, and he recommended that in packing, the plates should be placed as closely together as possible.

Mr C. RAY WOODS spoke of his own experiments regarding green fog, and pointed out that it could be artificially produced by adding pyrogallic acid to an ammoniacal solution of silver bromide.

The CHAIRMAN said that whatever might be the cause, or, indeed, he could perhaps say causes, of green fog, one might generally regard a short exposure and an undue forcing of the development as an immediate cause. He then remarked that someone present had suggested that there were two kinds of green fog, but he would emphatically say that there are more than two.

Mr. COWAN remarked that green-fogged plates often developed with brightness in the transparent parts; and if a plate has only a slight tendency to green fog, the matter is brought tolerably well under control by variations in the development.

Mr. WARNERKE now observed that green fog is practically unknown in Russia, even in the case of imported plates.

The CHAIRMAN said that he could partly understand this, as plates which were newly made would sometimes give green fog, but after complete desiccation the fault became eliminated; and in a dry climate one would not expect to hear so much of green fog as in a damp country.

Mr. COWAN said that many persons must have noticed that green fog often occurs where a trial plate is exposed and developed before being dried, although the bulk of the batch may be good.

Mr. SEBASTIAN DAVIS now remarked upon the "thin image" difficulty, and referred to the advantage to be gained by using a large proportion of bromide, and lengthening the time of development.

Mr. WOODS confirmed the importance of this point, and suggested that in many cases it becomes advisable to use as much bromide as two grains to each drop of ammonia.

Mr. DEBENHAM also approved of the principle of increasing the bromide and allowing a long time for development; he had used equal quantities of bromide and ammonia.

The CHAIRMAN now referred to the development of plates as a science which could never be learned without careful study. The preparation of the plates he regarded as merely mechanical, as any intelligent and careful person could be taught plate-making. Many persons increase the proportion of ammonia without also adding enough pyro to effect a reduction. It must not be forgotten that the pyro is the true developing or reducing agent.

Mr. COWAN now referred to the discussion on extremely small stops, which has recently taken place in the PHOTOGARPHIC NEWS, and he showed two pictures taken from the same subject, one taken with an aperture of $\frac{f}{32}$ and an exposure of two minutes, the other having been taken with an aperture of $\frac{f}{256}$ and an exposure of sixty-four minutes. Little difference could be detected, the definition being as nearly equal as possible; but the latter was, if anything, a little less vigorous than the former.

The CHAIRMAN, in connection with this subject, referred to his large pictures of Carnarvon Castle, these having been done with a pin-hole stop—perhaps $\frac{f}{500}$.

Mr. SEBASTIAN DAVIS now handed round a sensitometer-frame which was constructed of a sufficient size to admit any plate up to 8½ by 6½ being tested; by its use the inconvenience of cutting plates in the dark-room may often be avoided.

Mr. GEORGE SMITH next exhibited his new "Manx" stand. It is constructed of light pine wood, and although 5 feet high, its weight is only one and a-half pounds, and it closes to 2 ft. 8 in. The general principle is that of the Kennett sliding stand, but in order to prevent the side sway of the lower half of the leg, a kind of taper fish plate or web is fastened in front. The pin-holes at top of the legs are provided with brass bushing tubes, these being attached to the side plates. The light web plate on the lower half of the leg certainly gives the stand a remarkable rigidity, and also adds to it elegance, as the outline of the leg follows a regular sweep from top to bottom. In the triangular head is a tapped hole (¼-inch Whitworth) for safely storing the camera screw when not in use.

Mr. WARNERKE said that a friend of his who was present, the Baron de Koussoff, had met with exceptional success in treating some very sensitive plates which had been much over-exposed; his method being to immerse them in a ten per cent. solution of potassium bromide before development; but he did not wash off such bromide as might be adherent to the plates. As an illustration of the success of the method in question, some extremely fine pictures of the ancient Palace of the Czars at Moscow, where Peter the Great was born, were shown. The interiors were exceptionally fine.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 19th inst. Mr. W. H. PRESTWICH in the chair.

In the discussion on that portion of Mr. Coles' lecturette relating to intensification, Mr. W. E. Debenham said that the mercury and Schlippe's salt method need not be in the least objectionable as regards colour, for if a small portion of iodide be used with the mercury, an olive-brown colour would be obtained.

Mr. W. COLES found by using Edwards' formula of mercury with iodide, the negatives were not so red; but they became red afterwards.

Mr. COWAN spoke in favour of Monckhoven's method—mercuric chloride, followed with cyanide of silver.

Mr. A. L. HENDERSON was in favour of lime water, instead of ammonia, after the mercury treatment; acid pyro and silver intensification he found very uncertain.

Mr. W. M. ASHMAN passed round several negatives which were intensified in 1881 and 1882 by various means, including mercury followed by ammonia, lime water, cyanide of silver, and sulphide of ammonium, also acid pyro and silver; after printing, these negatives had been stored with others in packages in a dry place. Those treated with ammonium sulphide had not changed; all the others had deteriorated.

The CHAIRMAN thought the damage was caused by insufficient washing before and after intensification.

Mr. COWAN showed a negative developed with the soda developer recommended by Mr. G. H. Monroe, in the April number of the *New York Photographic Times*. He found it excellent for obtaining density, and well worthy of experiment. The following is the formulæ:—

Formula 1.

Sulphite soda (cryst.)	4 ounces
Hot water	11 „

When cool, acidify with from three to four ounces of sulphurous acid. Add dry pyro 1 ounce. Filter.

Formula 2.

Sal. soda	3½ ounces
Sulphite soda	¾ ounce
Water	64 ounces

To develop, use one drachm of No. 1 to each ounce of No. 2. By using more or less of No. 1, any change in density may be secured.

Mr. ASHMAN called attention to a sample of vulcanized fibre sent him by Mr. T. Norris, as being suited for many purposes in photography, it being a substitute for leather, vulcanite ebonite, &c. It is made both flexible and hard, and in thickness varying from $\frac{1}{50}$th to 2 inches, the price being about two shillings per pound. It was stated that alcohol, acids, or alkalies, would not affect it.

A communication was read from Mr. T. Norris in reference to a question asked by Mr. Mackie at the previous meeting. He found by experiment that when ferric chloride is added to hypo in small quantities, there is a precipitate, which, on analysis, was found to be an oxide, or hydrated oxide of iron (ferric), and no sulphur is thrown down when the solutions are neutral, if the solutions are made corresponding to $Fe_2Cl_6 + Na_2S_2O_35(H_2O)$. These, when mixed in equal quantities, give no precipitate, and there is a certain quantity of ferric chloride left; but if three parts of ferric chloride be added to four of hypo, there is a precipitate, the iron being completely converted into the ferrous condition. There is no sulphate formed. Further experiments are in progress.

Mr. W. K. BURTON asked what excess of bromide will give the best results in an emulsion, as he had lately seen it recommended to use a large excess?

Mr. W. B. WELLINGTON showed an example where the quantity of bromide of potassium used was of the same weight as the silver employed; the plate registered 16 on the sensitometer, and was very dense.

Mr. COWAN thought an excess would be favourable to density.

Mr. HENDERSON had gone so far as to use an ounce and a half of potassium bromide to an ounce of silver.

A Member said the addition of bromide of potassium to the finished emulsion had been frequently recommended for obtaining density: could as much density be gained by the subject under discussion?

Mr. HENDERSON contended that anything tending to slow an emulsion favoured density.

Mr. DEBENHAM desired to know how Mr. Henderson would obtain density in a very rapid emulsion?

Mr. Henderson: By the use of soft gelatine and the addition of meta-gelatine to the finished emulsion. He was engaged on some experiments with glycerine, sugar, and other substances for that purpose.

Mr. Burton could speak on the value of meta-gelatine as a valuable addition for making an emulsion more rapid.

Some experiments with the diffraction grating in Mr. Henderson's lamp terminated the proceedings.

Derby Photographic Society.

A meeting was held at the "London Restaurant," Derby, on Wednesday, the 18th of June, Mr. Richard Keene, Vice-President, in the chair.

The minutes of the previous meeting were read, and the following gentlemen were declared duly elected:—As honorary members, Messrs. R. J. Billinton, Henry Bolden, George Rice, and W. W. Winter; as members, Messrs. F. Campion, J. Crossland, E. A. G. Jewitt, J. Merry, and R. L. Warham.

The Chairman then read the proposed rules, and after a discussion, during which several alterations were made, the amended copy of the rules was unanimously adopted.

The first technical meeting of the Society was fixed for July 2nd, when a paper will be read by Mr. R. Keene.

After the usual vote of thanks to the Chairman the proceedings terminated.

The following are the officers of the Society:—

President—Captain W. de W. Abney, R.E., F.R.S.

Vice-Presidents—Charles Edward Abney, B.A., H. Arnold Bemrose, M.A., and Richard Keene.

Committee—Arthur J. Cox, James E. Kaye, and Thomas Scotton.

Honorary Secretary and Treasurer—Fred. W. Simpson.

Talk in the Studio.

Messrs. Johnson and Son, of Gough Square, have forwarded us two samples of their substantially-bound albums, the leaves being plain cardboard, so that photographs may be permanently mounted thereon. This system possesses, for amateur photographers, the advantage of preventing frequent losses of the picture, owing to unreasonable requests from admiring friends.

Estimation of Chlorine, Bromine, and Iodine in the Presence of one another. By F. Maxwell Lyte.—It has been shown that bromine decomposes silver chloride, and that iodine decomposes silver bromide. The author now communicates a convenient method of applying these reactions for quantitative purposes. The silver precipitate, containing all the halogens, is dried, weighed, and then dissolved in 30 to 40 times its weight of water, by adding the smallest possible quantity of potassium cyanide. A quantity of potassium bromide equal in weight to the precipitate is now added, and the cyanide decomposed by excess of dilute sulphuric acid. The precipitate, which contains bromide and iodide (any chloride being now bromide), is dried, weighed, and then redissolved as before. One and a quarter times the weight of the original precipitate of potassium iodide is now added, the cyanide decomposed as above, and the precipitate dried and weighed. The quantity of chlorine, bromine, and iodine present is easily calculated from the differences in the weights of the three weighings.—*Journal of the Chemical Society.*

The Vertical Camera for Photographing Natural History Specimens.—Mr. G. Brown Goode, writing in *Science*, recommends the vertical fixing of the camera for obtaining reproductions of natural history specimens, and long ago we pointed out the advantages of this arrangement for copying purposes. Mr. Goode says:—As a matter of fact, the vertical camera, now used for photographing natural history specimens, &c., is the outcome of a suggestion made in December, 1869, by Professor Baird to Mr. T. W. Smillie, the photographer in the U.S. National Museum, Washington, D.C., that the instrument be placed on an incline; the former having observed the difficulty experienced in photographing with the horizontal camera such objects as stone implements, fish, &c. This suggestion was acted upon; and in the following year (1870) Mr. Smillie invented the vertical camera, and with it introduced the use of a side-light which produced the same effect as the skylight with the horizontal camera. Mr. Smillie also attached to the side of the apparatus an endless screw, whereby the distance could be readily regulated between the lens and the object to be photographed. In 1871, and again in 1875, a camera of this kind was constructed specially for photographing the marine animals taken by the U.S. Fish-Commission at Wood's Holl, Mass. Its advantages were readily seen by Professor Agassiz, who asked and obtained Professor Baird's permission to construct for his own work a camera on a similar principle. Not less than six thousand negatives have been taken with the vertical camera by Mr. Smillie.

Photographic Club.—At the next meeting, on July 2nd, the subject for discussion will be "On the best method of making stereo transpareneics." Out-door meeting on Saturday afternoon next at Teddington, meeting afterwards at "Clarence Hotel," near the railway station.

To Correspondents.

*** We cannot undertake to return rejected communications.

H. de S.—You can obtain all the information required by writing to the Secretary of the Photographic Society of Great Britain. The address is "Water Colour Gallery, 5A, Pall Mall East."

F. Gascoigne.—Your letter has been forwarded.

A. G. Brophy.—1. It is quite clear that you have reason for complaint as regards such delays, but we hardly think that things are worse than in other lines of business. 2. Your suggestion shall be attended to.

Ad. Eggis.—We also hope so, but fear that the chance of finding it is small.

A. A. A.—Add a handful of salt in addition to the acid.

Photo.—1. What you suggest will answer very well indeed. 2. We do not know the address of the gentleman you mention, but we are sure that you can obtain the *papier maché* dishes from the firm you allude to.

Vindex.—We recommend you to obtain either No. 1 or No. 2; there is little or nothing to choose between them.

A B C of Photography.—The publishers desire us to call the attention of possessors of this valuable little book to a serious error in line 24, page 71:—"One ounce of ammonia ·880 *and* two ounces," &c., should read, "One ounce of ammonia ·880 *or* two ounces," &c.

J. L.—No, a whole-plate would be nearer the mark; but if you think out the question, you will find that the original statement is true within wider limits.

G. F. Webber, Junr.—1. It describes an arc the chord of which corresponds to a portion of the line joining the lens and the centre of the picture. 2. We rather think that the arrangement proposed by your friend is more convenient, and if you tell him so, you might ask him to send us half-a-dozen lines on the subject, and a sketch.

Leicester.—It is difficult to make it clear to you, unless you are acquainted with the ordinary chemical notation; but if we mention that in the following equation the mere writing of symbols side by side signifies that the weights represented are in combination, and that a small figure immediately after a symbol only multiplies the value of that symbol, we think you will be able to so far understand the matter as to reduce it to a simple rule-of-three sum. We will give further particulars if you require them.

Ag = 108
N = 14
O = 16

Therefore, $AgNO_3$ will be 170.

K = 39
Br = 80

Therefore, K Br will be 119.

The above quantities react together as follows:—

$$AgNO_3 + KBr = AgBr + KNO_3$$

The products are:—

$$AgBr = 188$$

and—

$$KNO_3 = 101$$

Fred W. Bellamey.—1. You may perhaps gain a little by raising the strength of the bath to 35 grains, but certainly not very much advantage will result. 2. If you like to leave the lens at our office, we will look at it with pleasure. 3. Why not adopt the gelatino-bromide process if you wish to do rapid work?

Chas. Horner.—Full working details will be found on page 378 of our volume for 1875, and also in other places. You can consult all the back volumes at our office.

Thos. Stokoe.—1. We have had the labels attached. 2. Thank you for allowing us to use it, but we will take care to do as you suggest.

A. H.—The specimen of work is very good, and if it is a fair example of your every-day productions, we have no doubt that you will be able to obtain the kind of position you wish for.

T. E. B.—Common carbonate of soda—that is to say, washing soda. —weighed after drying. Dry it in the kitchen oven or on the hob

E. CORDER.—There is certainly some fault as regards the sizing of the paper, but perhaps if you soak it in boiling water for ten minutes or so, you will remove sufficient of the sizing material. 2. It is always yellowish, and, as far as we know, there is no means of bleaching it. 3. Once a year only.

DR. REDPATH.—It should never be acid, as in such a case the deposition of sulphur is almost a certainty; but it ought not to be extremely alkaline. The right degree of alkalinity may be ensured by first making it neutral, and then adding five grains of carbonate of soda to each pint.

JOHN FILLITSON.—It may be necessary in very hot weather; but such a course is never desirable if it be possible to avoid it.

DOUBT.—Certainly not more than five shillings, but we think that half the sum would be nearer the mark.

MARK TEMPLEMAN.—1. White of egg is the best material to use, but it should be diluted with four times its volume of water and well beaten. 2. Considering that full information appeared in the last number, we may fairly decline to give you the details in this column.

REVERSED NEGATIVE.—A reflecting prism in front of the lens is perhaps the best arrangement, but many prefer to use a glass mirror silvered on the face.

H. PAULSON.—The case is quite clear to us, as you have not sufficiently washed out the hyposulphite. Several hours' soaking with frequent changes is not too much.

CHESTER.—Why not try the experiment, as one would think it easier to do so than to write? 2. Float the *back* of the sheet on the citric acid solution. 3. A temperature of 80° Centigrade is far too high, but 80° Fah. would be near the mark.

GEORGE.—Soak the prints in a saturated solution of biehloride of mercury, and they will disappear. Revival at any time is easy, mere immersion in a solution ef hyposulphite of soda being required.

LUX.—Coal gas always contains sulphur, and this is converted into sulphuric acid during combustion.

DIFFICULTY.—It is easy to obtain a good print from a broken negative, if you lay your printing-frame on a table suspended from an ordinary roasting-jack.

JOHN S.—Although the conditions are certainly rather hard, you should not complain, as you entered into the arrangement with your eyes fully open.

W. H. W.—Rub the glass with ox-gall, and allow it to dry before coating.

The Every-day Formulary.

THE GELATINO-BROMIDE PROCESS.

Emulsion.—A—Nit. silver 100 grains, dist. water 2 oz. B—Bromide potassium 85 grains, Nelson's No. 1 gelatine 20 grains, dist. water 1½ oz., a one per cent. mixture of hydrochloric acid and water 50 minims. C—Iodide potassium 8 grains, dist. water ½ oz. D—Hard gelatine 120 grains, water several oz. When the gelatine is thoroughly soaked, let all possible water be poured off D. A and B are now heated to about 120° Fahr., after which B is gradually added to A with constant agitation; C is then added. Heat in water bath for half an hour, and stir in D. After washing add ½ oz. alcohol.

Pyro. Developer.—No. 1—Strong liq. ammonia 1½ oz., bromide potassium 240 grains, water 80 oz. No. 2—Pyro. 30 grains, water 10 oz. In case of an ordinary exposure mix equal vol.

Iron Developer.—Potassium oxalate sol. (1 and 4) 80 parts, ferrous sulphate sol. (1 and 4) 20 parts, dist. water 20 parts. To each 4 oz. of the mixed developer add from 5 to 30 drops ten per cent. sol. potassium bromide, and 30 drops sol. sodium hyposulphite (1 and 200).

Substratum or Preliminary Preparation.—Soluble silicate of soda 1 part, white of egg 5 parts. water 60 parts. Beat to froth and filter.

Fixing.—Sat. sol. of sod. hypo. 1 pint, sat. sol. of alum 2 pints, mixed.

Cowell's Clearing Solution.—Alum 1 part, citric acid 2 parts, water 10 parts. Edwards makes this sherry coloured with perchloride iron.

Eder's Method of Intensification.—The negative is whitened by soaking in sat. sol. of mercuric chloride, and after thorough rinsing immersed in potass. cyan. 10 parts, potass. iod. 5 parts, mercuric chloride 5 parts, water 2,000 parts. As film becomes dark brown, the actinic opacity is increased; but prolonged action causes brown tint to become lighter, until at last the negative is no denser than at first.

Fol's Backing Sheets.—A chromographic paste is prepared with gelatine 1 part, water 2 parts, glycerine 1 part, and a very small addition of Indian ink. Strong paper or shirting is coated, and the sheets are laid, face downward, on waxed glass to set. Press to back of glass plate.

THE WET COLLODION PROCESS.

The Nitrate Bath.—Water 14 oz., nit. silver 1 oz., nitric acid 1 drop. Before using coat a small plate, and immerse it for 20 minutes.

Cleaning Preparation for New Plates.—Alcohol 4 oz., Jeweller's rouge ½-oz., liquid ammonia ½-oz.

Film-removing Pickle for Old Plates.—Water 1 pint, sulphuric acid 4 fluid oz., biehromate potassium 4 oz.

Negative Collodion for Iron Development.—Alcohol 1 pint, pyroxyline of suitable quality 250 grains, shake well and add ether 2 pints, *Iodize this by mixing with* one-third of its volume of alcohol ½ pint, iod. ammon. 80 grains, iod. cadm. 80 grains, brom. ammon. 40 grains.

Normal Iron Developer.—Water 10 oz., proto-sulphate iron ½ oz., glacial acetic acid ½ oz., alcohol ½ oz. The amount of proto-sulphate iron may be diminished to ¼ oz. when full contrasts are desired, or increased to 1 oz. when contrasts are unduly marked. With new bath quantity of alcohol may be reduced to ¼ oz.; but when bath is old more is wanted.

Substratum.—Whites of 2 eggs well beaten, 6 pints of water, and 1 dr. liq. ammon.

Intensifying Solution.—Water 6 oz., citric acid 75 grains, pyro. 30 grains. When used, add a few drops of the silver bath to each ounce.

Lead Intensification.—After neg. washing, immerse in dist. water 100 parts, red pruss. potash 6 parts, and nit. lead 4 parts. When it is yellowish white wash and immerse in liquid sulphide ammon. 1 part, water 4 parts.

Fixing Solution.—1. Potass. cyanide 200 grains, water 10 oz. 2. Sat. sol. of sod. hypo.

Varnish.—Shellac 2 oz., sandarac 2 oz., Canada balsam 1 dr., oil of avender 1 oz., alcohol 16 oz.

PAINTING PROCESSES.

Albumen Mixture for Paper.—White of egg 18 oz., 500 grs. ammon. chlor. in 2 oz. of water. Beat to a froth, stand, and filter.

Sensitizing Solution.—Nit. silver 50 grs., water 1 oz., sod. carb. ½ gr.

Acetate Toning Bath.—Chl. gold 1 gr., acet. soda 20 grs., water 8 oz.

Lime do.—Chl. gold 1 gr., whiting 30 grs., boiling water 8 oz., sat. sol. cbl. lime 1 drop. Filter cold.

Bicarbonate do.—Chl. gold 1 gr., bicarb. soda 3 grs., water 8 oz.

Fixing Bath.—Sodium hypo. 4 oz., water 1 pint, liq. ammon. 30 drops,

Reducer for Deep Prints.—Cyan. potass. 5 grs., liq. ammon. 5 drops. water 1 pint.

Sensitizing Bath for Carbon Tissue.—Bichromate potash 1½ oz., water 30 oz., ammonia 1 dr., methylated spirit 4 oz.

Enamel Collodion.—Tough pyroxyline 120 grs., methylated alcohol 10 oz., ether 10 oz., castor oil 20 drops.

Mountant.—1. Fresh solution of best white gum. 2. Fresh starch.

Collotypic Substratum.—Soluble glass 3 parts, white of egg 7 parts, water 10 parts.

Collotypic Sensitive Coating.—Bichromate potash ½ oz., gelatine 2½ oz., water 22 oz.

Collotypic Etching Fluid.—Glycerine 150 parts, ammonia 50 parts, saltpetre 5 parts, water 25 parts.

Printing on Fabric.—Remove all dressing from fabric by boiling in water containing a little potash, dry, and albumenize with ammonium chloride 2 grammes, water 250 cubic cents., and the white of 2 eggs, all being well beaten together. A 70-grain silver bath is used, and the remaining operations are as for paper.

Cyanotype Printing.—Water 1 oz., red prussiate of potash (ferricyanide) 1 dr., ammonio citrate of iron 1 dr. Prepare and preserve in the dark. Float the paper and dry. Fixation by mere soaking in water.

VARIOUS.

Luckardt's Retouching Varnish.—Alcohol 300 parts, sandarac 50 parts. camphor 5 parts, castor oil 10 parts, Venice turpentine 5 parts.

Matt Varnish.—Sandarac 18 parts, mastic 4 parts, ether 200 parts, benzole 80 to 100 parts.

Encaustic Paste.—Best white wax, in shreds, 1 oz., turpentine 5 oz. dissolve in gentle heat, and apply cold with piece of flannel.

FERROTYPES.

Collodion.—Ammonium iodide 35 grains, cadmium iodide 25 grains cadmium bromide 20 grains, pyroxyline 70 grains, alcohol 5 oz., ether 5 oz.

Bath.—Silver nitrate 1 oz., water 10 oz., nitric acid 1 drop.

Developer.—Ferrous sulphate 1 oz., glac. acetic acid 1 oz., water 16 oz.

Fixing and Varnish.—Same as wet collodion process.

The Photographic News Registry.

Employment Wanted.

Assistant Operator, first-class Retoucher.—S. G., 15, St. Peter's-st., N.
Assistant Operator at 30/-.—E. Hopkins, 51, Cossack-st., Southampton.
Lady, to Work-up, Ret., & Recep.-Room.—A. B., 72, Azenby-sq., Peckham.
Tinter, Spotter, &c. (lady).—5, Heaton-villas, Heaton-rd, S.E.
Operator, used to electric light.—W. S., 1, Chapel-rd., Notting-hill, W.
Assist. Operator, Printer, Toner.—F. M., 15, Stony-st., Caledonian-rd., N.
General Assistant, age 16.—B. R., *Photo. News* Office.
Operator and Retoucher in good house.—A. H., *Photo. News* Office.
Assistant Printer, age 19.—C. M., 8, St. Mary's-pl., South Ealing.
Printer and Toner, experienced.—T. N., 15, West Parade, Weymouth.

Employment Offered.

Lady Ret. & Recep.-Room.—F. W. Broadhead, 65, Welford-rd., Leicester.
Operator, good all-round.—T. Wright, Barking-rd., E.
Operator, at photo-litho, large plates.—J. S., 58, Farringdon-st., E.C.
Operator for field-work.—Mr. Gandy, 5, Bishopsgate Without, E.C.
Op. well up in posing & retouching.—W. Clayton, 6, London-rd., Leicester.
Op., all-round, for small studio.—H. T. Timperley, Darwin, Lancashire.
Printer & Toner, and also a Retoucher.—West, Eagle House, Gosport.
Negative Retoucher, good and quick.—G. Goodman, 6, Fort-hill, Margate.
Oper. & Retoucher, 50s.—N. Y. Photo. Co., 17, Bennet's Hill, Birmingham.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1318.—*July* 4, 1884.

PATENT OFFICE LIBRARY

CONTENTS.

READY-SENSITIZED PAPER.

We have recently heard favourable mention made of preparing ready-sensitized paper in accordance with a plan which, we believe, we have to ascribe to Captain Abney. In his "Instruction in Photography," we find that he states that if paper be thoroughly washed after sensitizing, and then be immersed in a solution of potassium nitrite, it will keep well, and that the resulting prints will be as vigorous as with unwashed paper, or as with washed but ammonia-fumed paper. He further stated that the principle which underlies the process is the application of a chlorine absorbent to the silver chloride. There is no doubt but that the usual plans of making ready-sensitized involve the use of citric acid in some shape or another, either in combination with silver, or else as free acid. We have tried the plan with potassium nitrite, and have but one objection to it—namely, its hygroscopic tendency, and its consequent passage into potassium nitrate, a salt which is absolutely harmless, but not possessing the chlorine absorbing properties that are necessary. We may say, however, if the paper be once thoroughly dried, and then one sheet kept face to face with another, that atmospheric moisture hardly affects it, as the paper remains nearly colourless, and the nitrite seems not to be affected in the albumen itself, presumably because the albumen surface is more or less impervious to moisture. We have toned prints taken on this paper four months after preparation, using the borax bath and the acetate bath with good results. These prints we have before us now, are vigorous, and of a good dark sepia tone. We have tried other preservatives besides nitrite, and with fair success—for instance, the sulphite of soda gives excellent results, and is not of the same hygroscopic nature as the nitrite. We have found that the acid sulphite is, perhaps, a better preservative than the neutral sulphite, for reasons which it is not far to seek. The toning of the prints taken on this paper is fairly satisfactory, and we would recommend that it be tried.

The theory of toning, as usually accepted, tells us, however, that only certain toning baths can be used. For instance, the lime bath, with which an excess of silver is requisite, is evidently unsuitable for paper so prepared; whilst the acetate bath or the carbonate of soda bath, or, better still, the borax bath, should all be available.

Regarding all ready-sensitized papers, we have one thing to remember, viz., that so far we have no absolute knowledge whether a neutral or acid condition of the paper is the better. Carbonate of soda applied to blotting-paper, and then placed in contact with the back of the sensitized paper, we know preserves it unchanged for a considerable time; the organic salt of silver or the albumenate, which is always the delinquent, remaining unchanged. This would point to the fact that a neutral condition is a good one, but it seems more probable that the real preservation consists in the exclusion of moisture from the surface, moisture being the prime cause of decomposition. It is for this very reason that we have our doubts about the nitrite of potash, as the organic salt ought to discolour spontaneously in the presence of the moisture which the former will naturally absorb; on the other hand, for brilliant prints and rapid printing, the presence of a little moisture is absolutely necessary. A good experiment to show this is to wash a piece of sensitized paper thoroughly, then dry in a water oven, and moisten a small piece of it with water. Another portion should be damped with a dilute solution of the nitrite, and the three pieces be then exposed to light. It will be found that the blackening takes place much the more rapidly with the last, less with the simply water moistened piece, and very slowly with the thoroughly dry paper.

This experiment will show the necessity of moisture as well as of a chlorine absorbent for attaining the maximum sensitiveness.

In preparing the paper already alluded to, we have found that it is better to float the albumen surface on a 20-grain solution of the salt to be used. This involves, almost of necessity, two dryings of the paper, but for experimental purposes it is not of any great moment. Should the plan be adopted commercially, the extra time necessary would undoubtedly be a drawback.

THE EOSINE COMPOUND OF SILVER, AND ISO-CHROMATIC PLATES.

In a recent communication Dr. Vogel referred to the eosine compound of silver as being itself a sensitive agent (p. 324), and he describes some experiments in support of his view. Herr V. Schumann has recently experimented in the same direction, and having introduced the eosine silver compound into a gelatine emulsion, coated a plate, washed it, and an exposure was made in a spectrograph provided with a quartz prism. The action began near D, and, if one excepts the recognised minimum at F, the action was approximately equal all through the visible spectrum. The sensitiveness for the yellowish green and that for the indigo may be regarded as about equal, according to Schumann, and he found that the minimum at F was not so extended as in some of his earlier experiments with eosine-bromide plates. The circumstance that the plates were reddish-brown, and that they did not lose this colour either in the fixing-bath or the washing, is likely to be a practical objection to the process. Even treatment with ammonia did not remove the stain.

When, instead of coating plates with an unwashed emulsion containing the silver compound of eosine and washing

the plates, the emulsion was converted into threads in the vermicelli machine and washed, the result was different. The sensitiveness to the yellow was found to be diminished, and the minimum at F proved to have extended; while the red colouration was far less than previously.

In order to arrive at a conclusion as to the reason of this peculiar effect of a thorough washing, Herr Schumann prepared some eosine-silver by adding an excess of nitrate of silver to a solution of eosine, and after having collected the precipitate on a filter he proceeded to wash it with water, and he found that as soon as all the accompanying nitrate of silver had been removed, the eosine-silver compound itself began to dissolve. From this it would appear that although the eosine-silver is insoluble in water containing a trace of silver nitrate, and perhaps also insoluble in water containing certain other saline bodies, it dissolves in pure water.

THE INTERNATIONAL EXHIBITION OF 1885.

LAST week we stated that photography, at any rate as regards its technical aspects, would have a good place in the Exhibition of next year, and we are now enabled to give particulars with respect to the classification as far as photography is concerned: the following being the particulars as given in the official circular, under section xxix.:—

1. *Photographic Processes and their Results.*—Methods of gelatino-bromide plate making, apparatus for making emulsion, apparatus for separating the sensitive constituent, coating, drying, and packing machines; emulsion and other processes; printing processes, silver, carbon, Woodburytype, platinotype, gelatino-bromide, collodio-chloride of silver, &c.; apparatus for washing, &c.; prints and negatives; methods for making photographic lantern slides.

2. *Apparatus (excluding lenses).*—Cameras, shutters, changing-boxes, slides, tents, lamps; apparatus for making enlargements, and for micro-photography.

3. *Application of Photography to various purposes, Typography, Ceramics, Relief-moulds, &c.*—Method of producing printing surfaces; photographic enamels, photographic printing on pottery; photographic reliefs. Use of photography in self-recording apparatus, in scientific observations, &c.

Photography also steps in under the heading of military equipment, optical instruments, and printing: while in addition it may be also represented in class viii. aëronautics.

The arrangments for the Exhibition are progressing very satisfactorily, and we need do no more than to give a list of the names of the executive council to make it appear that every effort will be made to render the collection as representative as possible. Sir F. J. Bramwell is Chairman, the Marquis of Hamilton Vice-Chairman, and the following gentlemen compose the Council: Sir Frederick Abel, Mr. Isaac Lowthian Bell. Mr. Edward Birkbeck, Colonel Sir Francis Bolton, Sir Philip Cunliffe Owen, Professor Dewar, F.R.S., Mr. Joseph Dickenson, Sir George Grove, Mr. E. W. Hamilton, Mr. Henry Jones, Mr. W. H. Preece, Sir Edward James Reed, K.C.B., F.R.S., Professor Chandler Roberts, Mr. John Robinson, F.R.S., Dr. John Stainer. Secretary, Mr. Edward Cunliffe-Owen, B.A.

The Exhibition, as already stated, will be devoted to illustrations of apparatus, appliances, processes, and products, invented or brought into use since 1862; and it will be opened in May, 1885, to remain open for a period of about five months.

No charge will be made for space, but exhibitors will have to pay every expense of transit, delivery, fixing and removing their exhibits, and erection of counters when required; and they must, either personally or by their agents, superintend the dispatch, transmission, reception, unpacking and installation, and at the close of the exhibition the removal of their goods; in default thereof the Executive Council reserves to itself the right of doing whatever may be considered necessary, and at the expense of the exhibitor. Should any goods be deposited in the exhibition premises during the absence of the exhibitor or his agent, the Executive Council will not be responsible for any loss or damage, from whatsoever cause arising.

Applications to exhibit must be made on printed forms, which will be supplied on application to the Secretary, International Inventions Exhibition, South Kensington, S.W.; these must be filled up and returned on or before the 15th September 1884. After this date no application will be received.

Except under exceptional circumstances, no applications will be entertained for space for objects which have been shown in the Smoke Abatement Exhibition, 1881; the Fisheries' Exhibition. 1883; or the Exhibition of Health and Education, 1884. The space allotted to agricultural exhibits will be strictly limited.

Exhibitors are requested to mark the selling price of the articles exhibited, so as to facilitate the judgment of the juries, as well as for the information of visitors.

No article exhibited may be photographed, drawn, copied, or reproduced, in any manner whatsoever, without the special sanction of the exhibitor and of the Executive Council.

It may be interesting to give the following particulars as to the classification of philosophical instruments (section xxviii.)—

1. *Optical.*—Lenses, prisms, telescopes, microscopes and accessories, spectroscopes, polariscopes, stereoscopes, photographic lenses, spectacles, eye-glasses, optical glass.

2. *Astronomical.*—Telescopes, transit instruments, equatorials, mural circles, driving clocks, siderostats, heliostats, altazimuths, methods of fitting observatories and mounting instruments.

3. *Physical.*—Acoustic apparatus, tuning forks, sirens, phonautographs, phonographs; apparatus connected with molecular physics, air-pumps, manometers, radiometers; apparatus for measuring, &c., heat, thermometers, pyrometers, calorimeters; photometers; kinematic, static and dynamical apparatus, mechanics.

4. *Electrical.*—Friction and induction machines, batteries and other sources of electricity, Leyden jars, condensers, electroscopes, electrometers, galvanometers, voltameters, dynamometers, magnetometers, rheostats, resistances, electrical units, induction coils, thermopiles, vacuum tubes.

5. *Chemical.*—Thermometers, hydrometers, pyrometers, furnaces, blowpipe apparatus, assaying apparatus, apparatus for organic and inorganic analysis, for gas analysis, and for volumetric analysis, laboratory fittings and apparatus generally, balances, re-agents.

6. *Mathematical.*—Calculating machines, indicating and registering apparatus, pedometers, counting machines, slide rules, planimeters, drawing instruments, ellipsographs, scales, straight-edges, gauges, surface planes, dividing engines, pantographs, cidographs.

7. *Meteorological.*—Barometers, thermometers, rain gauges, hygrometers, aneroids, anemometers, ozonometers, storm signalling apparatus.

8. *Geographical.*—Surveying apparatus, theodolites, chains, levels; underground surveying apparatus; apparatus for hydrographic surveying, and for marine investigations and observations; hypsometrical instruments, tide gauges; seismographical apparatus; projections, maps, charts, models, and globes.

9. *Nautical.*—Sextants, quadrants, sounding apparatus, logs, compasses.

10. *Weighing and Measuring.*—Weights, scales, balances; measures of length, graduated scales, verniers, steel tapes; measures of capacity; instruments for angular measurement, clinometers, goniometers.

11. *Biological.*—Apparatus for anatomical research; physiological apparatus; apparatus for collecting and preserving natural history specimens.

At Home.

THE STANNOTYPE WORKS.

SAFFRON HILL. It must be at least five or six years since we were here—perhaps double as many—and on that occasion we took a camera in the hope of securing a few studies of the picturesque squalor of the neighbourhood; but to obtain anything characteristic was out of the ques-

tion, as half-attired children and ragged women came trooping out to see what the strange party was doing, and even the swarthy Italian, who would invariably loll about his doorway until evening brought back his customers and the barrel-organs they had hired, moved himself. How much Saffron Hill has changed! We even miss the approach to it from Holborn, and find ourselves half-way towards the other end before we quite recognise our whereabouts. It is true that all evidences of the old Italian character of the street are not gone: one may still see little shops with boxes of maccaroni and various mystic condiments in the window. The barometer and thermometer maker holds his ground, and the looking-glass maker may be seen at work: but along a great part of the street the modern London factory has replaced dirty and crowded tenements, while large gaps in the line of buildings indicate further progress in the same direction.

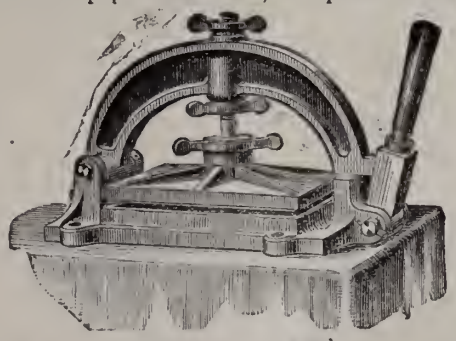
The type of factory to which we allude is a massively-constructed building with a very large proportion of window-space wherever light can be had, and but few, if any, partition or cross walls; the extensive floors being supported by iron columns and girders. The floors are usually let out to separate tenants, and sometimes a floor is divided by wooden partitions into a large number of separate holdings; indeed, so far is this system of subletting carried out, that one occasionally finds a space of about three feet square partitioned off, and let as a developing room. In many cases, perhaps in most, steam power is provided, the right to use it being included in the rent. When this is the case, the factory in flats is known as a "steam mill."

We begin to think that we may have gone too far up the main staircase of the building, but no; the row of stannotype presses, which we see through the open door on our left, shows us that we are on the right road. "This is the top floor but one," says Mr. Woodbury, who suddenly appears on the scene. "And we have the top floor also, a matter of some importance, as it gives us control over the roof, so that we can put up a glass house. Do we wish to come and see the place?" Mr. Woodbury is already half way up the last flight of steps, and we must follow; but we look the other way when he points to the step ladder leading to the roof. A part of the top floor is partitioned off as a drying room, and a light yellow curtain hangs in front of the window. A gas stove provides the necessary heat; but, as Mr. Woodbury points out to us, it is one of the "Calorigen" type, in which none of the products of combustion escape into the room. This is essential, Mr. Woodbury remarks, as burnt coal-gas contains products which make bichromated gelatine insoluble. The tissue from which the reliefs are made consists of a thick layer of gelatine spread on stout paper, and several sheets, which have just been sensitized, are clipped by one edge to a lath running across the room over the gas stove, and to the lower edge of each sheet a strip of wood is attached by a couple of American clips, in order to keep the tissue flat as it dries. This will not be dry for some hours, so a sheet of sensitive tissue is taken from a drawer and put in the printing-frame. But the exposure is not made under a negative. We have here a transparency, or, rather, four cabinet transparencies, on one glass. They are carbon transparencies made direct from the original negative, we are told, and as it is scarcely more trouble to make four on the glass plate than to make one, it is better to make four; especially as it is easy to print four pictures at once in the stannotype press. There is no occasion to wait until the exposure is complete, as here is a frame which has been out the required time. Mr. Woodbury removes the exposed tissue and immerses it in water, after which he lays it face downwards on a sheet of glass which is well flooded with water, removes the excess of water by means of a squegee; and then places it under gentle pressure for a few minutes. The glass to which the tissue now adheres is next placed in warm water, and very soon it becomes easy to strip off the paper backing, the greater part of the gelatine being left on the plate. The warm water soon acts on this, and dissolves away all those portions that have not been made insoluble by the action of light, leaving the gelatine standing up in high relief wherever the light has passed freely through the original transparency.

Before the gelatine relief can be used as a printing-mould it must be dried; and in order to expedite the drying, the glass bearing the relief is immersed in methylated spirit for an hour or so. The spirit absorbs nearly all the water from the gelatine, and the final drying is now a very quick affair.

The dry relief is next flowed over with a thin solution of india-rubber in benzole, just in the same way in which a plate is collodionized, and as soon as the excess of solvent has evaporated a sheet of tinfoil is laid on the somewhat sticky surface. The plate is now placed between the india-rubber rollers of a machine which very nearly resembles the ordinary wringing arrangement used by laundresses, and when the rollers cut fairly across the middle of the plate, they are brought together so as to grip very firmly, and the handle of the machine is moved backwards and forwards several times, the extent of the motion being increased each time until the extreme edges of the plate have been reached.

All is now ready for the printing. Mr. Woodbury takes a mould which has just been coated with tinfoil, and lays it upon the bed of a small press and adjusts the pressure by means of a screw. The mould is now slightly oiled by friction with a piece of greasy flannel, some gelatinous solution containing colouring matter is suspension is poured on, a sheet of paper is laid over, and pressure is applied.



THE STANNOTYPE PRESS.

The deep shades of the picture are represented by hollows in the printing mould, and the depth of these hollows corresponds to the intensity of the shades, so that a cast from the mould forms a positive picture with all the gradations of a silver print. Sufficient time having been allowed for the gelatine to set, Mr. Woodbury opens the press and strips the paper from the mould. The cast in coloured gelatine which adheres to its surface is a stannotype print of four cabinet portraits on one sheet of paper.

We see a row of about a dozen presses placed all along one side of a long table, and an assistant fills the moulds in succession with the coloured gelatine, lays on the paper, and applies the pressure. By the time he has charged the last, the and gelatine is set in the first of the series, he can remove the print, so that he may easily turn out fifty or sixty printed sheets per hour—say four cabinets on each sheet. Before sending out the prints, it is well to give a dip in an alum bath, and a rinse in water, the alum serving to render the gelatine insoluble.

Messrs. Woodbury, Treadaway, and Co. not only work the stannotype process, but also grant licences to those who may wish to make stannotype prints for themselves or for their customers; and among those who have adopted it may be mentioned Messrs. Sarony and Co., of Scarborough, and Wilson, of Aberdeen. That firms of such standing should endeavour to introduce permanent photo-

graphs in place of silver prints is much to their credit, and although in the case of a very small order—say a dozen cabinets—there might be a loss in adopting the stannotype process, there is an undoubted economy in the case of long numbers.

PHOTOGRAPHING *PULEX IRRITANS* AND HIS FAMILY.

BY J. H. JENNINGS.

PULEX IRRITANS, *alias* "F sharp," or common flea, is a familiar insect even to the most zealous worshipper of fresh air, soap, and water. If the spider does not scruple to hang her nets and pursue her murderous trade in kings' palaces, our lively acquaintance will at times invade the royal bed with equally bloodthirsty intent. Yet, unlike the spider, he takes no life; he is merely a robber, who would fain live at the expense of his victims, cruelly regardless of the terror and pain he inflicts.

Most persons know *P. irritans* merely through the qualities denoted by his specific name. His shape is so unfamiliar that many, on first seeing the photograph of a flea, are ignorant what insect it represents. This is partly due to the fact that the figures given, even in good works on natural history, are, for the most part, mere caricatures of the real insect; in fact, in a certain optician's window, known to the writer, there is a hideous monstrosity in water colour exhibited, with the inscription, "This is how a flea looks under one of A. B.'s 7s. 6d. microscopes!" If it be a fact that the flea *does* so look under one of the aforesaid microscopes, nothing much stronger could be said respecting their marvellous powers of distortion! *P. irritans*, instead of being a hideous looking monster, can really boast a neat, if not elegant figure.

The fleas belong to the order *Aphaniptera*, or "invisible wings," for although at present they fortunately have no wings, it was probably the fashion among the genus in former times to wear these appendages, which they have

THE MALE FLEA.

now parted with, like the folk who advertise grand pianos at a sacrifice, through "having no further use for them."

The photographs of the "human flea"—for each species of beast and bird possesses a special flea reserved for its own private use—reproduced in this week's NEWS, by the photographic process of Herr Meisenbach, show the male, female, and larva. The female is larger and stouter than the male, and, like most female insects, is endowed with a more potent weapon of attack. These lancets form part of the mouth-apparatus, and require a good quarter-inch to show them properly. When not in use, they are carefully enclosed in a sheath.

As a "sitter," the flea is very unsatisfactory. The most obstreperous baby can't hold a candle to him, and the most rapid drop shutter isn't fast enough: so all we can do is to photograph his corpse. Even here we meet with difficulties; instead of the "pallor of death," his dead body assumes, when embalmed in balsam, a strong amber colour, through which the actinic rays vainly strive to penetrate, unless aided by a powerful lamp and condenser.

The subjects of the illustration are from a slide by E. Wheeler, with male and female mounted under the same cover-glass. Both are very perfect specimens, but, as is the case with all these insects, the legs are far more transparent than the body, which renders it impossible to give a suitable exposure to all parts: consequently, in the negative, when the body is fully exposed, the legs come out too dense. This defect has to be remedied in the printing, by the simple expedient of covering the body, when fully printed, with cotton-wool, and giving a longer exposure to the legs. The specimens from which the photographs were taken had an exposure of seven minutes with a rapid plate, one and a-half inch lens, and small paraffin

lamp. With a larger lamp, the exposure would probably have been reduced to two minutes.

If papa and mamma flea give trouble through their non-actinic colour, baby flea is troublesome in just the contrary way. His body—or, rather, the thin integument that forms his mortal remains—is so transparent that taking a decent photograph of it is a feat on which the photo-micrographer may congratulate himself. The best way of doing it is probably to put on a strong light, and give an almost "instantaneous" exposure, by rapidly uncapping and capping the lens. Few persons would recognize a flea in the infant or larval stage; it is, in fact, a mere caterpillar, as genuine a grub as any, but minus legs. The metamorphoses of the flea are briefly thus: The eggs

THE FEMALE FLEA

THE BABY FLEA

—about twelve in number—are laid in blankets, carpets, rugs, old clothes, &c.; after a time they hatch, and become grubs, which feed on—well, no one knows exactly what! These grubs, or larvæ, become pupæ, which have the same form as the parent insect, but are enclosed in cases. After a proper period of, doubtless, meditative quiescence, the pupæ change into the perfect insect, ready to disturb the repose of all, from king to peasant.

The pictures given are enlarged about fifty diameters.

Review.

Workshop Receipts. Third Series. By C. G. Warnford Lock. (*London: F. and F. N. Spon*, 16, *Charing Cross.*)

The first series of the "Workshop Receipts," followed quickly as it was by the second, and now by the third, together form almost a reference library for the amateur mechanic and the unprofessional engineer. In fact, the

title "handy" does justiee to the comprehensive volumes which the enterprise of Messrs. Spon has given us, and there are few subjects of a scientific or technical nature about which one cannot find useful information.

A large proportion of the volume now under notice (about 150 pages) stands under the heading "Electric," and it consists of a full and comprehensive account of the various forms of battery now in use, practical and intelligible descriptions of electric alarums, bells, induction coils, measuring apparatus, microphones, photophones, storage cells, telephones, dynamos, &c. In fact, we find just such a practical description of electrical apparatus as will be acceptable to the man who rather wishes to make and use them, than to one who merely wants to pass an examination upon them. In a very well written article on alloys will be found all the information likely to be required in the workshop, and other metallurgical subjects are treated at more or less length; the latest details being given as to such metals as aluminium and magnesium. Under the headings of enamel and glass much useful information will be found, and we do not hesitate to say that the three series of workshop receipts should find a place in the laboratory of every experimental photographer.

ON THE WAXED PAPER OR CALOTYPE PROCESS, WITH ILLUSTRATIONS.

BY DR. HUNTER.*

THERE are few photographers of the present day who are probably aware of the fact, that one of the earliest processes for taking pictures is superior to many of the more elaborate and expensive processes that are now in use. (Views, and details of architecture, foliage, powerful effects of light and shade, or delicate traceries in marble, and carvings in wood, can be taken easily, delicately, and cheaply by this process.) I hope to be able this evening to show to you some of the results of the labours of our own countrymen, and of English, French, East Indian, Hindoo, Armenian, Rajpoot, and Polish photographers. I have been associated with persons of all these nationalities, and will leave you to judge for yourselves whether this process, from its simplicity and its relative cheapness, does not hold out to artists advantages which modern processes do not possess.

There are two other recommendations which ought not to be forgotten in matters of this kind, and these are, the large size of the pictures which can be taken on paper, their portability, and lightness in comparison with negatives on glass. There are, however, on the other hand, two difficulties which have to be contended with, and which prevent the process from being so satisfactorily applied to portraiture, or the representation of figures or animals, as the processes by wet collodion, or by the gelatino-bromide process. The first of these difficulties arises from the length of exposure requisite to obtain a clear, delicate, and satisfactory picture, and the other from the impossibility to get any living or moving creature to keep perfectly still for more than a minute or two, unless in profound sleep.

Compare the accompanying calotype of the corner of Roslin Chapel, taken more than twenty-six years ago by Messrs. Ross and Thompson, and some of their fine photographs of weeds done by this process, with pictures of the present day, and you will see how delicate they are in the shadows, and now well they have stood. Some of the views of Edinburgh from the Calton Hill, and the Dean Bridge, and St. Bernard's Well, taken by Colonel (now General) James Mayne in 1858, are also good and clear. But I have to bring to your notice subjects of great interest which appear to be particularly well suited for this branch of photography. These are views of temples, wooden-carved buildings, and pagodas in Rangoon, Ava, and Burmah, taken by Capt. Linnæus (now General) Tripe, and a Hindoo photographer named Iyahsawmy, from our Madras School of Arts nearly thirty years ago. In these days photography was in its infancy in India, but we were encouraged to commence a Photographic Society about the year 1852, in Madras, on account of the richness and grandeur of some of the architectural antiquities, and the picturesque nature of much of the scenery in the East. Our first school of industrial arts had been started in my own house in Madras in May of 1850, and it had met with such encouragement from all classes of the community, that the Photographic Society did us the honour of inviting our co-operation. This soon proved of benefit to all who were connected with both institutions, for we had the good fortune to enlist much of the artistic and photographic talent of Southern India. Many civilians, officers in the army, medical men, amateur and professional photographers, joined the Society, and the pupils in our school, who numbered 600 in daily attendance, soon found occupations of a congenial nature, as we were applied to for the manufacture of a variety of articles, both simple and complex in their construction, as camera slides, stands, stools, easels, and afterwards of cameras. Many of the chemicals for photography we had also to prepare, as the nitrate of silver, chloride of gold, salts of iron and soda, citric acid, and salts of potass. The hyposulphite of soda and several other chemicals we purchased, as they were cheap. I was surprised to find that the Hindoos had a practical knowledge of chemistry and of agricultural chemistry, and of the nature of soils, decaying rocks, and of tank, river, and running or stagnant waters, for which we did not give them credit.

* Extracts from a communication to the Edinburgh Photographic Society.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

REPORT OF THE CURATOR.

THE subjects dealt with in the lectures cover almost the whole of photography, in a general way. Mr. Darker showed us a series of beautiful experiments on light, mainly polarised, so as to give us an idea of the force with which we are constantly dealing, and a thorough acquaintance with which would, he considers, the better enable photographers to cope with the many difficulties they have every day to encounter.

Mr. Debenham told us what the lens attached to an ordinary camera-obscura was when Daguerre first began to use it for photographic purposes, and how, step by step, it has been improved. The lens as used by Porta could only cover a plate with a stop $\frac{f}{40}$ or $\frac{f}{30}$; by using a converging meniscus instead of a plano-convex, a much greater area could be covered, other things being equal. He showed us a series of lenses from the very early attempts down to the most recent, and those, as most of you know, will now effect with $\frac{f}{10}$ almost as much as the origiual lens would with $\frac{f}{20}$ or $\frac{f}{30}$. In the course of the lecture it was remarked that opticians of the present day aim too much at microscopic definitions at the centre, and neglect more than they ought to, the marginal definition. When they turn their minds to the improvements of this quality of the lens we may hope to see a great advance in the performance of the photographic lens.

Mr. J. Traill Taylor gave us a very interesting lecture on the manufacture of lenses, showing us what kind of tools are necessary for the production of the different curves on the surfaces of the glass, the rough glass as received from the glass manufacturer; also the different grades of emery and putty powder used in the grinding and polishing of the glass to the curves determined upon by the mathematician. Mr. Taylor has done us a good turn by illustrating his lecture in the manner he did. Some four or five of the members of the Association are now learning from a practical man the *modus operandi* from beginning to end as regards the production of lenses. What I should be glad to see would be the publication of a series of curves, by means of which, with two lenses as a nucleus, one could lengthen or shorten the focus of such a combination either by the addition of another lens, or by the substitution of a lens of different focus for one of the two already in the mount, and, in addition, that all, or at least most, of the positive lenses could be used singly for landscape purposes. Mr. Taylor has partly promised to give us the necessary curves for doing what I have here pointed out.

Mr. W. K. Burton gave us two formulæ for the production of emulsion.—one by the boiling method, and the other for very rapid plates produced by means of ammonia. The Ag Br produced by either of these methods can be allowed to subside, and then the supernatant liquid containing the altered gelatine and the salts resulting from the double decomposition poured off, so that perfectly-pure Ag Br is left behind. By "pure" I mean the sensitive salt freed from gelatine and foreign salts. Mr. Burton seems lately to have modified his formula very considerably as regards the quantity of gelatine associated with the Ag Br during boiling, and also the acidity of the liquid, in presence of which the ripening action goes on.

Mr. W. M. Ashman told us of the different methods that are and have been adopted in order to prepare paper suitable for photographic purposes. He exhibited specimens of prints produced on paper sensitized on baths of different strengths, and showed also the great advantage gained in some cases by using ammonia gas before printing. Here, again, a link is wanting. This is a lecture "On Toning and Fixing"; but this, I think and hope, will be supplied by Mr. Ashman during the next season.

Mr. A. L. Henderson showed the method he adopts in order to produce his beautiful enamels, which are always so rich and full of detail, and, above all, as far as our present experience goes, permanent. This subject is so important that if photographers of the present day wish their work to be handed down to posterity, they should take it up a little more seriously than it has been.

Mr. T. Bolas gave us a most instructive and interesting lecture on the production of photographic pictures in fatty ink. He showed us how a Woodburytype relief could be used in order to produce a picture on ruled paper, so that the image could be transferred to zinc and stone, and then how the former could be used in order to produce prints at the same rate as letter-press.

Mr. W. Coles, during the last lecturette, showed us results, and demonstrated on the spot how it is possible to alter the density of negatives, which, from force of circumstances, have been produced either too dense or too weak. From what he told us, I gathered that photographers ought always to try to get as much silver reduced as possible, and then, if necessary, to reduce the density by after treatment. When metallic silver only is left in the film, there is less chance of after changes than when the silver is converted into some other form, the stability of which we know very little. When intensification is absolutely necessary, bichloride of mercury followed by Schlippe's salt seems to give a more permaneut result than any other in the experience of the lecturer. Local reduction is most valuable, and in the hands of some can undoubtedly be made to improve negatives very much. For this purpose Mr. Coles prefers Mr. E. H. Farmer's reducer—ferricyanide of potassium and hypo—in consequence of one solution only being required, so that as soon as the reduction is nearly completed, the action can be arrested by washing.

The last chapter in this short history is in connection with Mr. F. W. Hart's lecture, wherein he gave us the exact dimension of furnace to be built, the proportions of carbonates and sand to be used with the haloid salt of silver to be reduced, and even the kind of fuel to be used in the furnace. The best precipitant for the silver from washings of prints, Mr. Hart finds to be dilute H Cl, and from the hypo. ordinary sulphide of potassium; but in neither case should they be used in too large an excess, as the resulting compound of silver is slightly soluble in them, and, in addition, in the case of the sulphide, the smell to many is anything but pleasant. Mr. Hart told us that within his own experience he is able to recover about ninety per cent. of the metal employed, so that if photographers would only take heed of what he said, they would be able in a very short time to diminish considerably the expenses in the printing department. A large amount of silver in many establishments, I am sure, goes down the sink, because the heads do not think it worth the trouble to save the hypo for treatment. All photographers would not, most probably, care about reducing their own residues; but, fortunately, refiners are glad to do it for them at a small charge.

THE ROYAL CORNWALL POLYTECHNIC ASSOCIATION: EXHIBITION OF 1883.

PHOTOGRAPHY: PROFESSIONAL AND AMATEUR.

Judges:—Messrs. Robert Fox (Chairman), W. Brooks, W. Naylor Carne, and G. Lanyon.

The judges have great pleasure in congratulating the Society on the success of the display in the Photographic Department this year. The number of exhibits is unusually large, and there is also a very marked improvement in the quality and general excellence of the pictures submitted. The judges wish specially to note the entire absence of anything approaching to careless or slovenly manipulation, which was very prevalent some few years since. In professional portraiture the exhibits are far below the average as regards numbers, but professional landscapes are exceedingly well represented; there are also a large number of instantaneous works, some of a very high degree of merit. The amateur work is likewise good. In the photographic appliance section there are some clever inventions and improvements, well worthy of notice; including several exhibits of lantern appliances, some of which are very ingenious.

Professional Photography.— The Woodbury Permanent Printing Company, of London, exhibit some important works of a very high order, notably No. 703—Madame Modjeska. They also exhibit two charming examples of enlargements on opal, very fine indeed. Mr. H. P. Robinson, of Tunbridge Wells, is very strong, and the judges are pleased to note the marked improvement in his exhibits over last year. To his "Merry Tale," a second silver medal has been awarded. Mr. R. Slingsby, Lincoln, sends a similar class of works, several very clear. There are two exhibitors of lantern slides, Mr. P. H. Fincham, and Mr. G. W. Gwyre, whose productions show clean and careful manipulation. They are mostly examples of wet collodion, which gives rather too cold a tone. Mr. Adam Distin sends three examples of his well-known style, the best of which is "Gloaming." Messrs. G. West and Son have a frame of studies of yachts, elaborately retouched. Mr. G. Higginson has two pleasing pictures, the "Lych Gate" and "An Old Watermill." Mr. F. M. Sutcliffe sends some of his charming little studies of shipping, &c., similar to those of last year. Messrs. Cobb and Son, of Woolwich, exhibit some extraordinary examples of instantaneous work, views of the streets of London, many of them taken from the top of an omnibus; a second silver medal has been awarded. An old exhibitor, Mr. J. Milman Brown, has a first bronze medal for his picture "A Misty Morning." It shows great artistic taste, is full of atmosphere, and generally effective. Mr. R. Walter has a few careful little bits of Epping Forest. Mr. H. Chubb sends some effective productions in portraiture. Messrs. John Chaffin and Son's exhibits this year are somewhat heavy; they would have been better had they received double the exposure. Mr. F. W. Broadhead is represented by two examples of portraiture, and a frame of views in Bradgate Park. The chief award in landscape is taken by Mr. N. McLeish, who has a first silver medal for his charming and effective production, "A Misty Morning." Mr. Norman May is represented by several examples of very careful work. Mr. G. Renwick sends eight frames, all of snow scenes, and somewhat monotonous. The best of Mr. J. Jackson's examples is "An Old Norman Doorway." Mr. James S. Catford has some very pretty views, which show careful study. Mr. W. J. Payne has a second silver medal for his excellent frame of panel portraits. The judges would like to see a larger style of portraiture from him. Mr. Luke Berry sends a few illustrations of careful work; and Mr. E. S. Ellery, some creditable examples in portraiture. Messrs. Day and Son contribute specimens of vignette portraiture, very soft and delicate. Messrs. Johnson Brothers, Henley-on-Thames, exhibit some perfect specimens of instantaneous photography, "Henley Regatta." A first bronze medal has been awarded to No. 809 as the best. They have also some exceedingly good pictures of harvest fields, and the whole of their work is soft and delicate. Mr. F. Argall, Truro, contributes a capital enlargement, "Boathouse on the Fal." He also sends a good enlargement of Dr. Benson, Archbishop of Canterbury. Mr. W. M. Harrison, Falmouth, has some very pleasing specimens of fancy portraiture. Mr. W. W. Winter contributes a frame of cabinet portraits, which are in the opinion of the judges spoilt by the mounting being too gaudy. Mr. Lyd. Sawyer has some pleasing out-door studies—"The Rivals" is the best. Mr. G. T. Whaite sends several frames of his well-known studies, which are well worthy of attention.

Amateur Photography.—Some very interesting pictures of life and scenery in the wilds of Labrador and Ungava, by Mr. J. R. Holmes, receive the first bronze medal. The manipulation is very good, considering the difficulties under which they must have been taken. Mr. J. G. Horsey sends several photographs, some of large size; but they are a little too black and cold, and in many instances the subject is too low in the plate, which dwarfs the hills. The judges are of opinion Mr. Horsey can do better work, and hope he will profit by these remarks. Mr. T. M. Brownrigg has a goodly number of examples, soft and delicate, of Italian and English scenery. Mr. C. V. Shadbolt sends some careful work. Mr. A. G. Tagliaferro contributes some very good instantaneous examples. Mr. W. R. Ridgway's frame of views in North Wales is fairly good. Mr. C. A. Fernley, of Reigate, is not so well represented as in former years. Mr. G. Brightman again sends some of his careful work, and has been awarded a first bronze medal for frame 872. Mr. P. H. Emerson sends a fairly good selection of views. The Rev. A. Malan has

a second bronze medal for some very good instantaneous pictures of express trains. This class of picture does not, however, give the idea of motion.

Photographic Appliances.—Mr. G. Hare, London, carries off the first silver medal for his New Patent Camera, which appears perfect in every way. It has great range of focus and every conceivable action, and is fitted with swing back and swing front, leaving nothing to be desired. Mr. W. G. Tweedy exhibits an instantaneous shutter, similar to Mr. S. P. Jackson's, only with four openings instead of two, passing one another. Messrs. T. F. Shew and Co., of London, also send a shutter similar to that of Mr. Jackson, with a screw to regulate the exposure. Their camera and other exhibits are of ordinary make, possessing no special feature. Messrs. W. H. Oakley and Co., London, are rather strongly represented in lantern appliances. Their portable lantern screen is a capital arrangement, and the Judges recommend it to the special attention of lanternists. They also send a portable and ingenious reading lamp, which seems very perfect, and a specimen of their interchangeable or blow-through jet, extremely well made. The notable feature is that it is fitted with a double regulating cock, whereby, when the gases are once adjusted, they can be shut off and turned on instantly without any readjustment, which is a very novel feature. A second bronze medal has been awarded to this invention. Mr. Cheney has several exhibits, including a changing bag for dry plates, tripod stand, and lantern-screen elevator. This last does not seem very substantial, and appears far too complicated to come into general use.

Notes.

Professor Eisenlohr will give a course of lectures on photography at Heidelburg University this summer, and we understand that an unexpected number of entries have been made.

Japanese paper handkerchiefs can now be purchased readily enough in London, and they are very useful in the laboratory. The strength of cloth is united with the absorbent quality of blotting-paper, while the price is such that one may well afford a new one whenever it may be required.

The exhibition of Mr. Dumaurier's drawings should have some interest for photographers, since without photography they would never have been seen in the pages of *Punch*, and possibly never attempted. Some years ago Mr. Dumaurier found his sight failing him, and he was warned that if he continued drawing in the minute style peculiar to him he would probably become blind. While in this difficulty a friend suggested that he should make his drawings about ten times larger than he wanted them for illustration, and have them reduced by photography. This plan the artist adopted, and so obtains a delicacy equal if not superior to that of his earlier days. He obtains also another advantage. The originals, being of a considerable size for pen and ink work, fetch a much higher price than if they were the same size as the cuts in *Punch*.

The phototype blocks which illustrate Mr. Jennings' paper this week are among the first made by the Meisenbach Company in this country. Their new establishment in Farringdon Street is now in active work.

A sign of the times. Baths, collodion filters, collodion pourers, pneumatic holders, glass cleaning-frames, and dusting brushes, may now be had second-hand for next to nothing.

There is little doubt the hygiene of the dark-room is too much neglected. A photographer the other day was complaining of continual head-ache and nausea. It was suggested he should look to his dark-room, but he ridiculed the idea that his dark-room could be the cause of it, as it was cool, large, well-illuminated, and ventilated by a patent method of his own. However, after some persuasion, he consented to make an examination, and discovered that the waste pipe of the sink led directly into a drain without the interposition of a trap. As his practice was to place the developing tray or stand in the sink, he got the full benefit of the poisonous emanations whenever he bent his head down to watch the development. Hence the head-ache and nausea. It is a good plan to stop up the waste pipe with a cork, which can be easily removed when it is necessary to empty the sink.

The heat in photographic studios has been very trying during the last few days. The best way of reducing the temperature is to have two or three light wooden frames stretched with calico, and kept saturated with water. One of these placed in a current of air, say in front of an open window, has a marvellous effect.

A fixing bath to which oxalate developer has been added is known to be a very energetic reducer; and Herr Martini finds that if a dense negative is left for half a day in a mixture of two parts of the usual hypo solution, and one part of fresh oxalate developer, every trace of the image disappears.

The luggage of the photographer is especially liable to excite the suspicions of the special "dynamite" police; but those who have felt their dignity hurt by having to explain matters, should read the Home Secretary's account of his own difficulties at Southampton. A square box of the "detective camera" type, with nothing projecting but the pneumatic tube and ball, can hardly be taken into a London railway terminus without bringing a plain-clothes officer down upon the bearer. We have tried the experiment.

The Republican candidate for the Vice-Presidency of the United States has declared himself to be a member of the Episcopal Methodist Church, and this declaration has impelled a well-known Methodist preacher to retort that if Senator Logan be indeed an Episcopal Methodist, "he must have joined the Church by telegraph, and have been baptised by photograph." We must confess we do not see sufficient "photographic point" in the "well-known preacher's" remark to justify the extensive circulation which has been given to it. If, now, the Senator had belonged to the sect of "Camer(a)onians," the photographic allusion would have had at least a nominal significance.

The metric system bids fair to ultimately become uni-

versal, and at the present time it is the only recognized legal standard in twenty-two countries; these having a total population of two hundred and forty-two millions.

A London firm which had been a successful exhibitor at the recent Calcutta Exhibition, has just received from the Superintendent of the Juries a photograph of the gold medal awarded to it, with an intimation that on receipt of £10 10s. (the price of the said medal), it will be forwarded. Or if the firm does not care to pay for a gold medal, it can have a silver one at a very much lower figure. To thus let exhibitors at international exhibitions pay their money and take their choice in the matter of awards is a decidedly novel proceeding, and it is not surprising that the firm in question declines to pay for the gold medal "awarded" to them, and mean to make the photographic reproduction do. They will be content, in fact, with the "look of the thing."

Dr. Vogel's proposal to use coloured glasses in conjunction with eosine plates for the reproduction of such coloured objects as paintings, is one capable of extensive application. Major Waterhouse, however, suggests that it may be better to illuminate the subject with coloured light. He says:—"Coloured glasses seem fatal to sharpness. A better plan would be, I expect, to throw a beam of *coloured light* on to the picture with a lime light or electric lamp. Some years ago I tried throwing a blue light on to a yellow object, and got a very good image of it. In this case the blue light was obtained by allowing the sunlight to pass through a piece of blue glass arranged so as to throw a blue tint on the object."

Many persons have, to themselves, satisfactorily explained the why and the wherefore of the special excellence which characterises Mr. H. P. Robinson's pictorial work with the camera; and they talk of expensive lenses, convenience for manipulation, well-trained models, and so forth. The real secret, however, lies deeper, and is to be found in the fact that holiday and work mean the same in Mr. Robinson's vocabulary. He has recently been labouring and recreating in North Wales; and we may hope that some of the results will form an attractive part of the next exhibition in Pall Mall.

A well-known caricaturist has just completed two companion portraits of the same individual, with the significant subscriptions in either case: "Before my visit to the Healtherics," and "After my Visit." The two subjects would make a good photographic study, for there is no doubt that only the most robust visitors to the new South Kensington show can taste with impunity all those samples of cake, custard, curds, candy, coffee, cocoa, and confectionery, which are so energetically pressed upon him by the various stall-keepers. "C-sickness," as it might reasonably be called, is well nigh sure to follow.

The term "optical sensitizers," as applied to colouring matters added to the films, can hardly be considered a very happy one, and Captain Abney protests against it; we fancy, however, that he will hardly object to "optical de-sensitizers."

Contrary as the two names may appear, they amount to about the same thing in actual practice; and the photographer who merely wishes to obtain a good negative from a painting, will not care much whether he exalts the sensitiveness of the plate for the yellow rays, or makes it less impressionable by the blue. The whole question is one of importance, as there is a demand for phototype blocks made directly from the work of the artist-painter.

The idea of adding such a physical sensitizer as the phosphorescent sulphide of calcium to an emulsion, is due to Mr. A. L. Henderson; and notwithstanding the chemical difficulties of the case, we have obtained results which indicate that physical sensitizers will some day become of practical importance.

It must not be said that the Government does not assist photographic research—occasionally. Mr. Gill, the Cape astronomer, was able to announce at the last meeting of the Astronomical Society that the Admiralty had promised him the necessary assistance to enable him to carry out his project of a photographic map of the heavens as regards the southern hemisphere.

Miss Mary Anderson has the satisfaction of knowing that a recent portrait taken of her is one of the largest of the stock sizes. It is called the "Heroic" size, and we shall soon no doubt get to "colossal," and have to be taken in instalments. The members of the Photographic Club of the future may, in fact, have to take in their portraits in parts, whilst the modest album of the past will have to be replaced by a photographic gallery.

But it is to be hoped that "cabinets" and other portable sizes will not generally go out in favour of the "heroic" and "colossals." Should popular taste, generally, follow the lead of "La Belle Americaine," giving away one's photograph will become a most elaborate process, demanding the intervention of a furniture van at the very least. And to receive one of these "photographs of the future" will be as awkward to most people as the receipt of a white elephant or a full-sized billiard table is now found to be. Few, in fact, will care to undertake the responsibility of receiving a friend's likeness, when its receipt involves running up a special wall on which to place it.

The sun acts as a clock-winder in Brussels. A shaft exposed to the solar rays causes an up-draught, and this draught sets a fan in motion; the fan of course winds up the weight of the clock, but when the weight is near the top, it puts a brake on the fan. The clock has now run for nearly twelve months.

According to an American paper, the latest phase of the business in the States is the photographing of cats. Babies have to a great extent gone out, and kittens are "in."

The tariff for "Pussy's" portraits is just double that charged for "human's," the reason being probably because a "cat-astrophe" of some kind is twice as likely when felines are focussed.

Patent Intelligence.

Applications for Letters Patent.

9117. SAMUEL DUNSEITH MCKELLEN, 18, Brown Street, Manchester, Lancashire, for "A portable photographic lens mount."—Dated 26th June, 1884.

9161. ALEXANDER MELVILLE CLARK, of the firm of A. M. and Wm. Clark, 53, Chancery Lane, Middlesex, Fellow of the Institute of Patent Agents, for "An improved panoramic photograph camera."—A communication to him from abroad by Paul Moessard, Paris, France.—Dated 26th June, 1884.

Patent Sealed.

1908. HENRY RAFTER, Artist, 1, Kingswood Place, Dacre Park, Lee, Kent, for "Improvements in obtaining relief printing surfaces."—Dated 22nd January, 1884.

Specifications Published during the Week.

5373. HERBERT JOHN HADDAN, of the Firm of Herbert and Company, Solicitors of Patents, of 67, Strand, in the City of Westminster, Civil Engineer, "A new or improved method of and apparatus for controlling an engraving, cutting, or impression tool or instrument, according to the varying conditions of a given pattern or picture."—A communication to me from abroad by The Bain Electric Company, of Chicago, Illinois, United States of America.

This invention consists in controlling an engraving, cutting, or impression tool or instrument, by means of light or heat rays so that the operations of said tool correspond to the varying conditions of a pattern from which said rays are passed, and all parts of which are successively subjected to said rays. In carrying the invention into practical effect, I use a pattern (a photographic negative or positive, or any polished or transparent or translucent plate or sheet having upon it a pattern formed by lines or shades) which will, to a greater or less extent, obstruct the transmission or reflection of rays of light or heat from a flame, or heated or luminous body. In passing the rays to or through said pattern plate, I prefer to use a lens that will focus said rays upon the plate, and to then pass the latter back and forth or otherwise move it so that every portion will in succession be subjected to the rays. It will be obvious that if the rays passed thus from a pattern plate of varying opacity are thrown upon a substance or device which will respond to the varying intensities of the rays, the latter may be made the means of effecting the adjustment of a cutting tool traversing the surface of, or traversed by, the object to be cut, in unison with the movement of the pattern plate. Different appliances, depending upon the character of the work to be performed, are used in carrying out this mode of operation. In producing *intaglio* or relief, a burr or drill, or milling tool may be used—for engraving, a gouge, chisel, or cutting tool is employed; in any case, the tool traverses the object to be cut, or the latter moves beneath the tool, in harmony with the movement of the pattern plate, and the position of the tool, determining the depth or character of the cut, is regulated by the intensity or quantity or radiant energy of heat or light rays passing from the traversing pattern. In the drawing is illustrated an apparatus for automatic engraving in which a case, closed except at one point, where an opening permits the passage of rays of light or heat emanating from a source focussed upon a pattern plate (in this case a photographic negative or positive) by means of a lens. The rays passing through the pattern plate are received upon a block of selenium or a selenium cell, which forms part of an electric circuit, the resistance of which will, therefore, be proportioned to the amount of light or heat to which the cell is subjected. When a pattern plate is used adapted to reflect more or less light according to the design upon the plate, the radiant energy may emanate from any source, and be transmitted to the face of the plate, and reflected therefrom to the selinium or other circuit controlling medium, as indicated by dotted line. The circuit includes a battery and electro-magnet, the armature of the latter being pivoted and extended to form a lever, geared or connected with an arm carrying a graver. A spring capable of having its tension nicely regulated is arranged to lift the armature from the magnet. The plate to be engraved moves beneath the graver in unison with the pattern plate. As shown, both are upon a slide, which is reciprocated longitudinally, and moved laterally step by step, so that gradually all parts of the pattern plate are traversed by the rays, and all parts of the plate are carried beneath the graver. The slide may be caused to partake of any of the movements common to engraving machine slides or plate-holders, the means of providing such movements being too well known by those skilled in the art to need particular description. In the drawing for an example, however, I have illustrated one of the most primitive, the longitudinal reciprocation being produced by a crank or slotted rotating disk, and the lateral step by step motion by a screw rod having a ratchet, on one end connected to the slide, and engaging with a spring pawl on the bed or frame of the machine. As the strength of the current increases and decreases with the intensity of the rays received upon the selenium cell, there is a corresponding variation in the power of the electro-magnet, and the armature thereof is subjected to a varying force tending to draw it to the magnet against the power of the spring, so that the graver is withdrawn from, and carried towards, the plate according as the heat or light rays are less or more obstructed in their passage through the pattern plate. The depth of the cut is thus regulated and caused to correspond with the varying influence of the radiant energy, inasmuch as in proportion as the passage of the rays is interfered with by the varying character of the pattern, the strength of the current will be varied and will produce a corresponding variation in the adjustment of the tool. An equivalent of the selenium cell in some cases would be a thermo device, as a thermo pile generating its own current of greater or less intensity, or quantity, under the varying character of the rays, and controlling the operating magnet directly or indirectly as before described. Any desired means may be employed to secure a coincidence of movement of the pattern and the object to be operated on. These means will differ with the difference in the character of the work to be done. In some instances, the object operated on will be curved or cylindrical, and will revolve as the pattern slides; in other cases, while there is a unison and coincidence of motion, the degree of motion will differ, the duplicate in such case being proportionately larger or smaller than the pattern.

5464. ALBERT KEPLER, of Peckham, in the county of Surrey, ACHILLE MORIN DE PREMION, and ALFRED PIGEAU, of Lombard Street, in the City of London, "Improvements in the manner, method, or mode of preparing and producing coloured photographs, and in the arrangements and apparatus employed therefor."—*This invention received Provisional Protection only.*

In carrying our invention into practical use or effect, we take one or more ordinary photographic positive or positives, and place the same in the preparer, which may be a metallic box, chamber, or receptacle so arranged as to admit of being adjusted to, and maintained at, a uniform temperature without any great variation or loss of the heat, in which preparer we have previously placed a suitable quantity of the solution or compound hereinafter described; this solution or compound is kept at a uniform temperature of 90° Centigrade (say, 195° Fahr.), which is maintained for three hours, during which time it is allowed to act on the positive or positives, and at the expiration of this time it is allowed to cool and coagulate, and remain in that state for twelve hours. At the end of this time, the preparer is again heated in order to allow of the withdrawal of the said positive or positives. The solution, compound, or bath, hereinbefore spoken of, is composed of equal parts of clarified resin and essence or spirits of turpentine in about equal proportions, which are melted together and maintained at or in a liquid state, or that due to a temperature of 85° to 90° Centigrade—say 194° Fah; and this must be kept up whilst the positive or positives are in the bath for about twelve hours. On removing them from the preparer they will be found to have a thick layer or coating of the solution or compound adhering to them, from which it is necessary they should be freed. For this purpose we employ a dryer, consisting of a metallic trough or receptacle arranged with a jacket or casing into which steam, hot air, hot water, or other suitable and convenient means for heating, being adjusted to, and maintaining the required temperature, is or are allowed to pass, so as to maintain the same temperature as that in the preparer, namely, 90° Centigrade—say 195° Fahr. The positives are placed at the bottom of the dryer, which is, or may be, provided with a false bottom and a ready and convenient means for removing the positives, and the heat causes the solu

tion or compound to melt and run off from them to the bottom of the dryer, and when the solution or compound is fully liquid, and has passed off, the positives may be lifted out and suffered to drain for a few minutes without cooling, when the remaining solution or compound may be easily removed from the positive by the aid of a wash consisting of benzine applied by the aid of a sponge or wad, or in any other convenient or suitable manner. The positives are then laid on a perfectly clean surface for a period of a few minutes till dry, varying according to the dryness and temperature, when they will be found ready to be painted at the back with the desired artists' oil colours, each of which is laid on uniformly over the surface it is intended to occupy, without any regard to light or shade on such part, and in consequence of the materials used, and the manner of employing the same, the paper on which the positive has been printed permits the colours to penetrate into and amalgamate with it in such a manner as to render them indelible whilst retaining the brilliancy and durability of oil paintings, and they may be then cemented or mounted on a suitable surface or surfaces, and subjected to a strong pressure to render the adhesion complete. By preference we employ the best artists' oil colours, which may be either those contained in tubes, or we may take the dry colours and mix them as required.

Patents Granted in America.

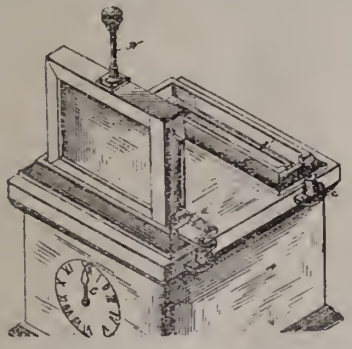
300,438. EDWIN L. BERGSTRESSER, Hublersburg, Pa., "Dry-plate holder."—Filed March 28, 1884. (No model.)

Claim.—1. A cabinet for containing plates, provided with mechanism which automatically registers each plate upon a dial as it is placed therein after exposure, substantially as set forth.

2. In a cabinet for holding plates, the combination, with mechanism for automatically registering each plate as it is inserted, of a pusher for moving the plates forward, substantially as set forth.

3. In a cabinet for holding plates, the combination, with a suitable dial having figures marked thereon, of a shaft carrying a ratchet-wheel, and an indicator, and a lever provided with means for operating said ratchet-wheel, as set forth.

4. In a cabinet for holding plates, the combination, with a suitable dial having figures marked thereon, of a shaft carrying an indicator, and ratchet-wheel, a spring-pressed pawl engaging



said ratchet-wheel, and a lever provided at its forward end with an arm to engage said ratchet-wheel, substantially as set forth.

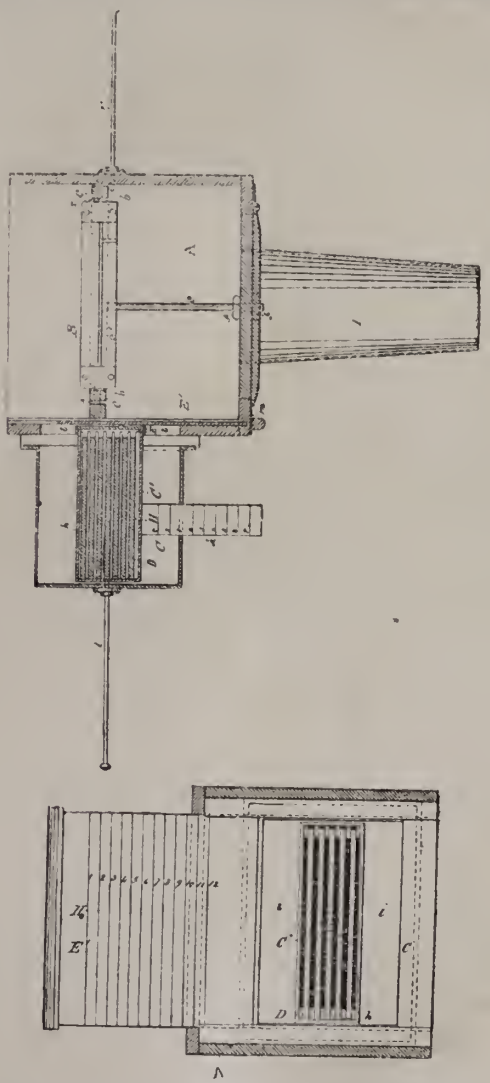
5. In a cabinet for holding plates, the combination, with a dial having figures marked thereon, of a shaft carrying a ratchet-wheel and indicator, and having bearing at its rear end in a bracket secured to a strip enclosing said ratchet-wheel, a spring-pressed pawl adapted to engage said ratchet-wheel, and a lever provided with an arm for actuating the same, substantially as set forth.

6. In a cabinet for holding plates, the combination, with a dial having figures marked thereon, of a shaft carrying a ratchet-wheel and indicator, a spring-pressed pawl adapted to engage said ratchet-wheel, a lever provided with an arm at its forward end for actuating said ratchet-wheel, a spring for retaining the same in position, said lever being provided at its forward end with an upwardly-projecting extension, and a coil-spring, located between the end of said lever and the floor, substantially as set forth.

300,477. HENRY G. JONES, Philadelphia, Pa., assignor of one-half to Henry S. Keller, same place, for "Photographic Camera." Filed April 1, 1884. (No model).

Claim.—1. The sliding plate E', having a scale, H, in combination with the camera-box A and sliding case C', provided with a handle, *k*, having a scale H', for regulating the adjustment of the case C', substantially as described.

2. The plate-rest B, having pivots *x*, and adjusting screw-rod *e*, provided with nuts *ff*, in combination with the camera-box A for regulating the position of said rest, substantially as described,



3. The combination of the adjustable strips *a* and *a'*, provided with arms *b*, with the side strips *c c*, of the plate-rest B, by means of pivots *b'* and pins *d*, for expanding or contracting said strips to receive plates D of different sizes, substantially as described.

300,478. HEINRICH KAYSER, Berlin, Germany. "Photographic Exchange-box." Filed April 9, 1884. (No model).

This invention has already been described and figured in the PHOTOGRAPHIC NEWS, present volume, page 331.

PHOTOGRAPHY AND THE NEWSPAPERS.

BY S. H. MORGAN.*

I THINK it was Charles Dickens who said of the newspaper-man, "He photographed everything, epitomized everything, was dead headed in this world, and expected to be in the next." This saying, though made twenty years ago, may be looked at in the light of propheey, for it has become literally true that in the illustrated newspaper photography, enters so largely that we can safely say that without photography the illustrated newspaper of to-day would be impossible. And this change has taken place within the past decade.

* A paper read before the Photographic Section of the American Institute at their last meeting.

It is told of the last of the Harper Bros., that when he was dying, he called his son to give him some advice in reference to the management of the business which was about to fall to his charge. Said he: "Above all things, take care of the *Weekly* (referring to the illustrated paper which bears their name); do not be tempted by new processes to deviate from the old and well-tried methods of engraving. If a rival does undertake to give the events of oue day in an illustrated form on the next, and you should come along like the old lumbering stage-coach one week later, remember that you put it on record,—you put it on record." The idea of recording current history carefully and accurately is the true duty of journalism. But I regret to say that the press, instead of educating the public up to a healthy standard, seek to pander more and more to the increasing demand for sensational and untruthful rubbish,—the result being our people's memories are ruined by over-much reading, aud when a paper publishes an illustration of an event a week after its occurrence, the public look upon it as a page of ancient history, and the same paper that would not allow a plate produced by photography to be used in its pages during the life of its founder, now uses them very largely.

To give you an idea of the varied uses of photography on a newspaper, we will classify the different kinds of illustrations. There are, first, portraits; second, landscapes—views of all kinds; third, news events; fourth, cartoons and the various ideal pictures; fifth, maps and mechanical drawiugs.

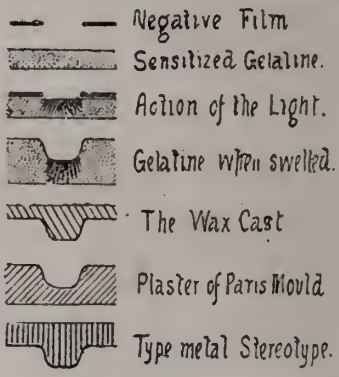
All portraits published are from photographs. The only exceptions I remember were those of the late A. T. Stewart and George Elliot. In all landscapes, where accuracy is required—as, for instance, where architecture is the prominent feature—photographic views are utilized; without photographic portraits, our moderu cartoon would be impossible. Then for news events, instead of sending an artist to sketch an event as formerly, the local photographer is telegraphed to attend to it. Here is the first aid of photography to bring the picture into the publication office. It is a messenger that brings the facts without coloring or exaggeration. Well would it be for the typographical side of the paper did they have such truthful reporters. But, then, though the photograph brings to the editor facts, the naked truth, as it were, they need some modification before publication; for instance, in the case of a man's portrait, if not a recent one, it must be altered to show his increased age. But it would be a dangerous proceeding on the part of any illustrated paper to take the same liberty with a female face, particularly if the possessor is a live woman. In the case of a picture with business in, as it is called, the particular object to be advertised must be brought out most prominent. The camera, as we all understand, does not show the partiality that the advertiser wishes; for instance, his two-story story must become a five-story one, with throngs of customers passing in and out, and loaded trucks at the curbstone; or, if it is a factory, it must extend a block or two further down the street, all the neighbouring buildings sinking into insignificance in comparison with it. I am afraid I am giving away too many trade secrets. I only mention these things in order that when you see "from a photograph," under a distorted illustration, you will understand that it is not due to any idiosyncracy on the part of the photographer. And here let me state something that may not be considered by those who expect the day is not far distant when we will publish all illustrations direct from the camera without the intervention of an artist or engraver, as many papers are now doing; and, by-the-bye, if there is any glory attached to the matter, I claim here that your worthy President, Mr. Newtou, made the first negative, and I attended to the remainder of the process of producing the first illustration direct from nature in a daily newspaper without the intervention of artist or engraver.

I have many examples of such a process as is now used in the illustrated press of to-day, and the difficulty to its more general adoption will be found in the fact that very rarely will a subject be photographed with the composition, arrangement, light and shade, of a quality possessing sufficient "spirit" for publication in *facsimile*.

At present, all photographs are altered to a greater or less extent before presentation in the newspaper. This is done after the subject is photographed the second time. We have seen how photography brings the matter to the editor's hands. Now we come to the second use of photography. The photograph is now either photographed on wood, or an untoned photographic print is made on plain paper. On this latter an artist traces the design with a pen and india ink, and here the alterations are made; if a view, the artist introduces figures, alters the light and shade, and sometimes changes the composition. When he has obtained all the assistance he requires from the photograph, he bleaches it away by pouring over the photographic print, on which is his india-ink drawing, a solution of bichloride of mercury in alcohol. This leaves his drawing on perfectly white paper.

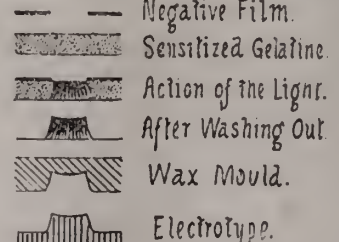
Now, in case of the photograph on the wood, the addition of figures and the other changes I have spoken of are made over the photograph-covered wood block before it passes to the engravers, where it is changed still more. In the case of a wood engraving photography is used but twice, ending with the placing of the subject on the wood; so we will dismiss it. But with the india-ink drawing on paper, photography must again be used to produce a printing block. The various processes for accomplishing this are innumerable, but they can be classed under three heads—First, what is called the etching method; second, the photo-relief plate method; third, the photo-electrotype. Of the three, each has its advantages. The first, or the "etching method," gives a plate of zinc usually, in which the whitest or hollow portions of the plate have been dissolved by an acid; the second or photo-relief plate method produces a printing plate in stereotype metal; and the third yields an electrotype. All three depend on the rendering insoluble of gelatine or albumen when in combination with a bichromate either of potash or ammonia when it is exposed to light. The peculiarities of the resulting plate I will state briefly. The zinc etching method produces the most artistic result, but it is not sufficiently mechanical in its manufacture to ever be much used here. It necessitates the personal attention of a man with artistic judgment throughout the whole process of the etching. In Europe, where artistic labour is poorly paid, they can afford to work this process successfully.

I will illustrate the differeuce between the three processes for newspaper work by diagrams on the blackboard, showing a



sectiou of a line, and the steps taken in each process towards its production.

The above shows the several stages in the photo-relief method. First the negative film is brought in contact with the sensitized gelatine, when the latter is exposed to light, after which the gelatine, which has been so exposed, is placed in a tray of water;



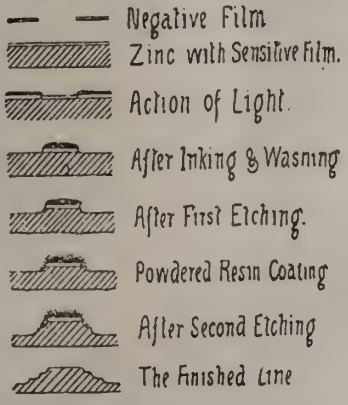
The portions unhardened swell, then a cast is taken in a waxy composition, from which is made a plaster of Paris mould in which to cast the type-metal stereotype, the peculiarity of the resulting line being that the corners of the line are slightly rounded. For book and magazine printing, where the press cylinder turns perfectly true, and time can be given to the process of overlaying, in the hands of an artistic printer this line with the rounded face can be taken advantage of to produce

a light or heavy line according to the pressure of the paper on it during the operation of printing.

With the photo-electrotype line which is produced by the action of light on a sheet of sensitized gelatine, as in the photo-relief process, the unhardened gelatine is washed out with a soft brush and a tepid solution, leaving the portions acted on by light in relief. From this an electrotype is made in the usual way.

The face of the line produced by this process is the reverse of the photo-relief line—that is, it is concave where the other is convex, the corners being sharp and highest where the wear is greatest. This makes the most serviceable plate for newspaper work, giving a square honest line at each impression.

The above diagrams illustrate the various steps of the zinc-etching process. A plate of zinc is coated with a film of albumen sensitized with bichromate of ammonia. After the exposure to light, the plate is rolled with a fatty ink, then the unhardened albumen film is washed away, leaving the ink only on the lines,



protecting them from the action of the acid in which the zinc plate is immersed. After a slight etching, the plate is removed from the acid and dried, then powdered dragon's-blood is brushed against the sides of the line. The zinc plate is heated, the powdered dragon's-blood combines and forms a resinous coating, which protects the sides of the line from the further action of the acid. This process of drying, dusting with the powder, heating, and etching is repeated many times till the requisite relief is obtained, the finishing line showing, as in the diagram, a series of steps down the side corresponding to the number of etchings.

The finest illustrated newspaper in the world prefers the plate produced by this process, but, as stated, it cannot compete in this country with its more mechanical rivals.

Correspondence.

WANTED, A PRINTING PROCESS FOR INDIA.

Sir,—I see a brother amateur away in Gaubati, Assam, whose letter appears in your issue of the 25th ult., is desirous of being informed of a "simple process" which will enable him to take a few prints off his negatives without much trouble. As he says he has tried most of the known processes, but has found them all unsatisfactory, I am afraid his wishes cannot be gratified, for there is not a single process expected to produce good results that does not give some sort of trouble to the manipulator. Of the three processes he has named, the silver works the best in India, and I would advise "Assam" to cling to it.

With regard to the "messy" part of this process, a great part of it can be removed by following the plan I have recently adopted. I use ready-sensitized paper from England, which keeps good for four or five months after its arrival. It turns yellow after the fifth month, but the small quantity which I import from time to time is used up before it becomes really unfit for good work. I find it does very well in a climate like Tavoy, and I am sure Gaubati is not a worse place.

For the benefit of "Assam," allow me to make a few suggestions. Let him send for half a quire at a time of paper, and let him keep this carefully excluded from light and damp air in a tin tube.

For travelling, the following are required:—

2 wooden trays* large enough to wash prints in.
1 porcelain dish, 10 by 8, for toning.
1 porcelain dish for receiving toned prints.
1 porcelain dish, 10 by 8, for fixing.
1 porcelain dish, 10 by 8, for receiving fixed prints.
1 large wooden tray to wash fixed prints in.
1 2-ounce stoppered bottle containing 15 grains gold, dissolved in 15 drachms of water or alcohol.
1 small bottle containing ½-ounce soda bicarb.
1 wide-mouthed bottle containing 6 pounds hyposulphite of soda.
1 small box of scales and weights.
2 8-ounce glass measures: one for measuring water for the fixing bath, and the other for the toning.
1 1-ounce measure (8 drs.)
A few printing-frames of the required sizes, and a few empty brandy-bottles.

All these, with the exception of the wooden trays, which must be packed separately, will go into a box or leather trunk not too large for a man to carry. In his tent, let him set apart a small portion, made dark by means of blankets. This to be used for changing the paper in the frame. The paper should be cut up to the required sizes the previous night, and placed flat between the leaves of a book. Print during the day, and tone and fix in the cool of the evening, after the sun has set, by candle light. The toning bath may be made up just before beginning to wash the prints, by taking 3 grains soda bicarb., 1 drachm gold solution, and 8 or 10 ounces water. This bath tones very fast, and great care should be taken that the prints are moved about continually. The fixing solution should be made up during the day before he commences to print. The paper is to undergo four thorough washings. By following these few suggestions, I am sure "Assam" will get on first-rate.

Asking your pardon for taking up so much of your valuable space, I remain, yours faithfully, A. W. Lonsdale.

Tavoy, Br. Burma, 26th May, 1884.

PACKING PLATES WHEN TRAVELLING.

Sir,—A good way to store plates which have been exposed, during travel, is to lay between them slips of clean paper of the exact size of the glasses, but about a quarter of an inch longer.

The excess quarter inch should be folded over twice, one-eighth of an inch, and the double thickness of paper thus formed at the edge will be found sufficient to prevent the glasses or films from rubbing together.

Moderately stout, smooth note paper will suit, and if the paper is cut half an inch longer than the plates, and folded at both ends, the protection is more perfect.—Yours faithfully, J. C. Hannyngton.

GELATINO-CHLORIDE PAPER.

Dear Sir,—Will you allow me through the columns of the News to call the attention of manufacturers to a quotation from an address delivered at the Liverpool Amateur Association in February last by Dr. Kenyon on the subject of the heading of this letter. The portion of the paragraph to which I allude runs thus:—"And I venture to hope that through gelatino-chloride emulsion, we may come to a perfect paper process, one which will give the perfection of a glass transparency on paper free from the loss of detail and finish sustained in the toning and fixing of ordinary paper prints. This, it occurs to me, might surely be attained by some such process as by coating enamel paper with gelatino-chloride."

* These are red circular trays sold in the bazaars in almost all the large towns of Burma. If "Assam" has a friend in Akyab or Rangoon, he can get him to buy him a few at Re 1/4 or 1/8 each.

My object in writing also includes the hope of again drawing to the subject the attention of such influential workers as Dr. Kenyon, Rev. H. J. Palmer, and others whose names are familiar to us in the NEWS as pioneers in photography, with a view of inducing them to use their influence (by the introduction of the subject at their societies, or by the use of their pens in the journals) in urging manufacturers to the production of an article the desirability for which has been alluded to in the NEWS in your article on gelatino-bromide paper, 11th January, 1884.—I am, dear sir, yours faithfully,

G. F. WEBBER, jun.

Proceedings of Societies.

London and Provincial Photographic Association.

The annual meeting of this Society was held on Thursday, the 26th ult., Mr. W. M. ASHMAN in the chair.

Mr. F. W. HART exhibited a quarter-plate developing kit, suitable for travellers, consisting of a case for chemicals, two celluloid trays, three zinc trays, draining stand, and washing trough fitted with adjustable syphon. The total size when packed was 6 by 4½ and 3 inches.

The subject of diffraction was then introduced, and a discussion ensued, several members taking part.

Mr. W. B. B. WELLINGTON directed attention to a peculiar opalescent appearance in certain portions of a sample of sheet gelatine, the markings not being discernible until the gelatine had been soaked for some time in water. He thought it probable that the substance which caused the gelatine to appear opalescent might prove to be one of the causes of green fog.

Mr. A. L. HENDERSON related a curious experience of a friend, who invariably obtained green fog when he added strong liquid ammonia to his emulsions; but not so when he reduced it with water, the amount of ammonia being the same.

The technical business being disposed of,

The SECRETARY read his annual report. The following is an abstract. The past year has been one of progress financially, and in actively maintaining the objects of the Association, the balance in hand proving that the experiment of fixing the qualification at a low rate has lead to a successful result. The characteristic feature during the past year has been the series of lectures given by members on subjects of photographic interest. Many demonstrations have been given, and discussions taken place weekly. Donations of photographic and other scientific literature have been made, also some apparatus. While it is an agreeable duty to recount the gains of the Association during the past year, on the other hand the contemplation of a loss in the death of a distinguished and valued member, Mr. H. B. Pritchard, caused profound sorrow among the members, creating a loss in the photographic profession sensibly felt and not easily supplied. Distinguished for those abilities which secured for him the love and esteem of all with whom he was associated, it is only natural that his death should be referred to with no common feelings of regret. A letter of condolence was forwarded to Mrs. Pritchard, and duly acknowledged by her.

The Secretary further says, that members should not be content with merely paying their subscriptions; but they should take an active interest in the proceedings of the Society.

Forty-four members have been elected during the past year, making a total of one hundred and twenty.

The report and balance sheet was adopted, and a vote of thanks passed to the auditors Messrs. Cowan and Mackie.

Mr. HADDON (Curator) read a report embodying a resumé of the lectures and general work of the Society (see page 422).

Upon motion, a vote of thanks was passed to the officers *en block*, for the services rendered during their year of office.

The following gentlemen were then elected officers for the ensuing year:—

Trustees—Messrs. W. K. Burton and W. Cobb.
Curator—Mr. A. Haddon.
Treasurer—Mr. W. H. Prestwich.
Secretary—Mr. J. J. Briginshaw.

Rule 7 was slightly modified, so far as concerns the date of subscription becoming due.

Liverpool Amateur Photographic Association.

The monthly meeting of this Association was held on Thursday, the 26th ultimo, Dr. KENYON, President, in the chair.

The minutes of the May meeting were read and confirmed, and Messrs. Barker, Evans, Hartley, Hughes, and Moore, were elected members of the Association.

The Rev. H. J. PALMER proposed, and Mr. A. W. BEER seconded, a resolution that the Shrewsbury excursion to Condover, Acton Burnell, Pitchford, and Buildwas Abbey be held on Thursday, July 17th, in lieu of the excursion to Churchtown, and this was carried unanimously.

The Rev. H. J. PALMER read a paper descriptive of a recent visit to Hawarden, and exhibited a number of specimens of his work there, including some fine portraits of the Premier.

Mr. R. CROWE described a number of exhibits sent by Mr. Atkinson, of Liverpool, including some bottles of corrugated metal for the safe carriage of concentrated developing solutions, Samuel's very ingenious changing-box slide, a camera fitted internally with Kirkby's shutter, and Blair's tourograph. The last exhibit excited much interest from its many novel and ingenious features. Mr. Crowe pointed out many of its advantages over other cameras, and especially its lightness and strength, the capital arrangement for the rising front and swing back, and the exceedingly clever double dark slide.

The CHAIRMAN announced the donation to the Society of fifteen 10 by 8 prints, by Mr. Beer; three numbers of *Photography* from the Editor in Chicago; and one number of the *New York Photographic Times*, from the editor.

Mr. H. SIMPSON described a cheap and compact camera and case combined, invented by himself. The case consists of a box of quarter-inch baywood covered with American cloth, and measures 12 by 7 by 10 outside. The side is hinged to the body of the case at the bottom. The camera bellows are fastened to the centre case. To use the camera, the side is unfastened and laid down at right angles to the case. The bellows and rising front are drawn out and kept perfectly rigid by wire supports, as used in the scenograph. These supports are strongly hinged one-quarter of an inch inside the case, and when closed up, fold over the camera front. The side is hinged on the top, and a bag and frame is drawn out of the box. The bag is preferable to a bellows in this instance, as the former may be fastened within one inch of the edge of the case, thus leaving two inches of clear space inside between the end of the bag and the camera bellows. The frame is supported in the same way as the camera front. The plate is placed in an arrangement of metal gimbals held in position by brass screws and slides, thus giving the effect of a double-swing back. The gimbals are carried in a metal frame, which works in the two inches of space referred to, and is moved backwards and forwards by a rack-and-pinion motion. The pinion passes through the top of the inside of the camera, and through a packing-box at one end, where it is turned by means of a small stock key.

Messrs. Beer and Riley exhibited prints of negatives taken during the last excursion to Rivington Pike; Mr. Cornish, some views in Devonshire; Mr. Plympton, pictures in Hereford and Gloucester; and Mr. Crowe some instantaneous pictures taken with Kirkby's shutter.

After votes of thanks to the Rev. H. J. Palmer, Mr. Crowe, Mr. Simpson, and the other exhibitors, the meeting adjourned.

Edinburgh Photographic Society.

The eighth meeting of this session was held in 5, St. Andrew Square, on Wednesday evening, 4th inst., Mr. W. NEILSON presiding.

The minutes of the last meeting having been approved, Messrs. John K. Dawson, Alex. B. Dawson, and Richard Kerr Miller, C. E., were elected ordinary members.

A lengthy discussion took place on the new edition of the rules, proofs of which were submitted at last meeting by the Council. It having been agreed at last meeting to term them "laws," they were read *seriatim* and very fully discussed, Messrs. Forgan, A. B. Stewart, Forbes, and Craig Christie taking prominent parts.

Dr. HUNTER read a paper illustrated by upwards of ninety calotype prints, few being less than twelve by fifteen (see page 422). These were examined with very great interest, and a cordial vote of thanks to Dr. Hunter was passed by acclamation.

Mr. NORMAN MACBETH, R.S.A., brought before the notice of the members the importance and desirableness of making the

study of the picturesque more an object of this Society, and for its encouragement in this direction, handed for inspection the work which was awarded the first prize of the South London Photographic Society last year. That Society have instituted as one of their principal aims in their proceedings, the setting apart each month the best production then submitted for competition—without names of parties concerned, but having a title or motto attached to each work. These again at the close of the session are submitted to a competent judge (unknown to the members, or at least not having seen the works before), who adjudicates, and assigns the best.

Leeds Photographic Society.

The usual monthly meeting was held on Thursday, June 5th, Mr. W. Teasdale, F.R.M.S., in the chair.

Prof. Rucker, F.R.S., delivered a lecture upon lenses.

Prof. Rucker said: The ideal lens would so deflect the rays that fall upon it from any single point, that, after passing through it, they would meet in a second point, which would thus form the image of the first. In real lenses this condition is not fulfilled, for two reasons. In the first place, convenience dictates that the surfaces of lenses must in general be either plain or spherical, and rays of light which diverge from a single point cannot, by passage through a lens bounded by such surfaces, be made to converge to a single point. Hence a defect arises, which, since it depends on the spherical form of the surface of the lens, is called spherical aberration. In the second place, each ray of white light is broken up into its constituent colours, and to the separation of these is due (among other effects) that the position in which the best optical image is formed is not necessarily that in which the clearest photographic picture will be obtained.

In the lecture, the principal methods of diminishing these defects were briefly discussed. Spherical aberration may be minimized for objects at a given distance by giving the lens a suitable form, but the correction will be less perfect for other distances. The distance from the lens at which the image is formed is also dependent on the distance of the objects. A lens in which this defect is marked fails to form a clear picture of objects which are not all at the same distance from it. The blurring due to this is diminished by reducing the size of the pencils of light which pass through the lens by means of a stop. This, however, is attended with the disadvantage that the amount of light which falls on the plate is reduced, and therefore also the quickness of the lens is diminished. If the stop be placed close to the lens the rays which pass through it at different angles are brought to a focus at different distances, so that either the centre or the edges of the field are indistinct. In this case the field is said to want flatness. By moving the stop away from the lens, rays parallel to the axis pass through the centre, while those inclined to the axis are transmitted by parts nearer to the circumference of the lens. The fact that the focal length is different for the central and circumferential parts is thus utilized to diminish curvature of the field. This remedy, however, tends to produce distorted pictures, but the nature of the distortion is different according to whether the stop is in front of, or behind, the lens. By placing it between two lenses, opposite distortions may be made to neutralize each other. The use of too widely separated lenses is attended with the drawback that the quickness and angle are diminished. Finally, chromatic aberration, or the breaking up of white light into its constituent colours, has to be avoided, and this may be done by the use of achromatic lenses, the various parts of which are formed of different kinds of glass.

The principal faults referred to may be thus summed up. A small stop increases the depth, but diminishes the quickness of the lens. Moving the stop from the lens diminishes the curvature of the field, but increases the distortion, and reduces the field of view. A large aperture increases the quickness, a large focal length diminishes it, the time of exposure being inversely proportionate to the square of the diameter of the opening, and directly proportionate to the square of the focal length.

The principles above enunciated were illustrated by the case of a combined objective for landscape and portrait work.

Messrs. Pearson, Warburton, Reffell, Bransom, and others took part in the discussion.

North Staffordshire Amateur Photographic Association.

The ordinary monthly meeting was held on Monday evening, June 30th, at the Mechanics' Institute, Hanley, Mr. C. Alfieri occupying the chair.

The Secretary presented his financial report for the past six months, showing a balance in hand of £1 7s. 9d. This was adopted, and, the minutes of the last meeting having been read and confirmed,

On the motion of Dr. Griffiths it was resolved that an excursion to Alton Towers and Croxton Abbey be made on Saturday, July 5th, the party to meet at Stoke Station at 2 p.m., and proceed thence per rail to Alton.

The Chairman cautioned the more inexperienced of the members against over-exposing their plates, he having found the light in the Derbyshire district last week very actinic, one second's exposure having spoilt a plate devoted to Haddon Hall.

Mr. Allison passed round some fine platinotype prints from negatives of groups of ferns.

After some conversation upon various topics photographically interesting, the meeting terminated.

Talk in the Studio.

Major Waterhouse's Photo-mechanical Processes.—An exceptionally fine series of collotypic pictures illustrative of Indian art at the Calcutta Exhibition, have been sent to us by Major Waterhouse. Excellent specimens of heliogravure are also forwarded by Major Waterhouse, and although the general character of the latter is remarkably similar to the collotype, there is a boldness and vigour about the impression from the *intaglio* plate which one seldom sees in the collotype.

Ready Sensitized Paper Made by Mr. Valentine Blanchard.—Some paper which Mr. Blanchard sends us proves exceptionally sensitive, and tones very well in a chloride of lime bath. There can be but little doubt that the use of ready-sensitized paper is becoming more general, and many fail with it because they cannot be brought to see the importance of keeping it in a cool place, and where the atmosphere is uncontaminated with sulphur compounds conditions; which are generally practicable if a little care be exercised.

The Book Trade Exhibition in Leipzig.—This Exhibition has been notable for the great prominence it gave to artistic matters as bearing on the publishing trade, and the catalogue of the Exhibition will form a permanent memorial of many interesting features of the Exhibition, as it contains numerous illustrations of photo-mechanical processes.

The International Exhibition at Turin.—A correspondent who has just come from theExhibition writes:—"For several hours I wandered about without finding anything whatever of photographic interest, but at last I made enquiries of an attendant, who took me to the place. There was fairly good every-day photographic work, and there were some good portrait enlargements, but nothing very noteworthy. The apparatus seemed to be well made, but presented no points of novelty worth specially mentioning."

Trichlorpyrogallic Acid.—Indications of the existence of the above-mentioned body, and also of the corresponding bromine derivative, were obtained by Stenhouse and Groves some years ago; and quite recently Mr. C. S. E. Webster has carried on investigations in the same direction. To prepare the chlorine compound, the following method is now adopted:—To 5 grams pyrogallol in a large test-tube, 12·5 c.c. of strong acetic acid (60 per cent.) are added, a quantity insufficient for its solution. The test-tube is kept cool by being surrounded with water, and a rapid current of dry chlorine is passed through the liquid. Volumes of hydrochloric acid are then evolved, the colour changes to a deep reddish-brown, and in about half an hour the liquid, which is saturated with chlorine, coagulates to a semi-solid mass of fine needles of the new compound. These are well drained from the mother-liquor, washed with acetic acid of sp. gr. 1·04, in which they are only slightly soluble, and recrystallised with the usual precautions, from one of its several solvents. Trichloropyrogallic acid is only slightly soluble in cold water, but dissolves in its own weight of boiling water, recrystallising on cooling in fine white needles. By prolonged contact with water it is decomposed. It is freely soluble in alcohol and in ether in the cold. In acetic acid, benzene, chloroform, carbon disulphide, and carbon tetrachloride, it is only slightly soluble in the cold, soluble in boiling. It dissolves in boiling hydrochloric acid, and recrystallizes on cooling in transparent needles. On adding a solution of barium hydrate to its ethereal solution, a deep blue colouration is obtained. With solution of sodium

sulphite it gives a red coloration, which is fugitive. It is decomposed by concentrated nitric acid with evolution of nitrous fumes. The bromine compound is obtained by the direct action of bromine on tannin, and it is very similar in its general character to the chlorine derivative.

PHOTOGRAPHIC CLUB.—At the next meeting, on July 9th, the subject for discussion will be "On Focussing." On Saturday afternoon, out-door meeting at Kew Gardens, west end of Lake, and afterwards at hotel, on Green, near Bridge.

To Correspondents.

*** We cannot undertake to return rejected communications.

C. Q. N.—In the case of a gelatine emulsion, all you have to do is to add about twice its volume of alcohol (methylated will answer), and to well compress the curdy precipitate in a cloth.

JOHN THOMPSON.—If a reflector is placed in front of the objective, a reversed negative will be obtained; but ordinary looking-glass will not answer, as a portion of the light would be reflected from the outer surface of the glass, but the greater part from the metallic layer. Confusion of the image would consequently result. In order to obtain a suitable mirror, silver is deposited by the so-called chemical process upon a piece of accurately surfaced glass, and the outside of this silver is carefully polished by means of a soft leather and rouge. Of course, such a reflector is liable to become tarnished: and when a reversed negative is only occasionally required, many persons prefer to use a reflecting prism in front of the objective.

DASWIR.—1. The pictures are extremely good; indeed, we have seldom seen better instantaneous photographs. 2. We have written to you.

V. D.—Imperfect fixation. Either you do not leave them a sufficient time in the hyposulphite bath, or else you use the solution when it is quite freshly made, and consequently colder than the surrounding atmosphere.

E. J. RUSSELL.—It appears rather to be a matter for litigation between yourself and the party mentioned, than for our interference. Still, we shall be pleased to help in any way if possible.

Capt. S——.—We have sent a number containing very nearly what you require, but we intend to insert an article on the subject in the course of a few weeks.

PHOTO.—In each case a mixture of stiff starch paste and lamp-black is one of the best materials to use. Apply it with a soft sponge.

WET PAINT.—It has nothing to do with the nature of the paper upon which you work, and the only way is to obtain your colour and materials from another source; or perhaps you have used some non-drying oil in mixing.

JAMES HANSON.—Information as to the best methods of colouring at the back of the print is to be found on pages 611 and 740 of our last volume; but such pictures have very seldom a high artistic value. 2. Details as to photographing on canvas will be found in Pritchard's "Studios of Europe," which is published at our office, price 2s.

MABEL.—Mr. Pancoast's shutter is not made commercially as far as we know, but any skilled mechanic could construct it for you. 2. Doubtless they can be obtained from the makers of the apparatus, Messrs. Marion and Co., of 22, Soho Square, W.

X.—1. We think nothing is so reliable and practically useful as glass, and we should not think of using anything else ourselves, even if about to undertake such work as you propose. 2. The ordinary gelatino-bromide process will give you less trouble than any other; but unless you have had experience, you should put yourself through a rigid course of schooling. If you have much leisure, you may do this by working alone; but if, on the other hand, you are pressed for time, it would be well to arrange for instruction under an experienced photographer.

PRINTER.—An article on the subject appeared on page 226 of the present volume. The principal causes are: first, the use of a very strong sensitizing bath in conjunction with highly albumenized paper; second, the employment of freshly albumenized paper; Third, sudden changes in temperature in working, as when a fixing bath which is abnormally cold from the recent dissolving of hyposulphite is used; fourth, transferring the prints from a very dense liquid to a very light one, and *vice versa*. This state of things can be obviated by adding common salt to the last rinsing water before fixing, and to the first washing water after fixing—about a handful to each two gallons of water.

GEORGE LEE.—1. The series is not yet finished, but when complete it is quite possible that it may be reproduced in book-form. 2. Several of the numbers are out of print.

SMITH AND B——.—We have forwarded your enclosure.

A. PETITT.—We do not keep such a list, but you may find what you require by referring to our advertisement columns.

W. G. HONEY.—The shutter has merits, but we do not think there is any point about it which would be worth your while to patent. The primary idea is old, and you can only claim some details of secondary importance.

G. C. C.—Such a change in colour is not uncommon when it is kept in a room where much gas is burned. No ready-sensitized paper will remain in good condition if exposed to an impure atmosphere.

OMEGA.—1. Our own experience is that Easter is a more favourable time for making a holiday tour in Holland, as during the hot months the stagnant water in some of the canals is occasionally very foul; and moreover we have found the atmosphere very much clearer in the early spring. 2. Duty will be charged on your apparatus, but not enough to make the impost burdensome. 3. There is so much of interest in all the towns you mention, that you would be unwise to omit any of them: and moreover they can all be visited in a few days. 4. We believe that there are no restrictions, and do not think you would be interfered with unless you made an obstruction. We shall have pleasure in giving you any other information in our power.

J. S.—See a letter by Mr. Hanyngton in our present issue.

F. STEWART.—There are several ways of transferring printed titles to the negatives, and in the case you refer to an impression is probably taken from the type on a piece of transparent gelatine, and this is grafted on the negative by cutting away the film and cementing the strip of gelatine down in the vacant space.

W. H. B.—We think it no longer exists, but cannot speak with absolute certainty.

SOLUBLE COTTON.—It is hardly reasonable to expect so old a sample to be in good condition, and you had better either prepare some yourself, or obtain it from a dealer.

The Photographic News Registry

Employment Wanted.

Mounter, Spotter, &c. (lady).—A. H., 12, Crogsland-rd., Chalk Farm-rd.
Emulsion Maker, expe.—I. X. L., 28, De Gray-st., Newcastle-on-Tyne.
Operator and Retoucher, good.—Artistic, 32, Twyford-st., Caledonian-rd.
Lady, to Tint, Spot, &c.—A. G., 5, Heaton-villas, Heaton-rd., Peckham.
Printer, &c., age 21.—H. O., 17, Market-hill, St. Austell, Cornwall.
Ret. & Col. (lady).—Miss Edwards, Conway-villa, Dunstan-rd., W'hampton.

Employment Offered.

Lady Artist, Opals & Paper.—Nigra, *Photo. News* Office.
Oper., clever with children.—A. McLeod, 29, Stockwell Street, Greenwich.
Operator & Retoucher, indoor.—Hills & Saunders, Cambridge.
Printer, to assist Operating & Retouching.—Dew, Jesson-st., Coventry.
Operator & Retoucher for W. Indies.—J. Haddon, 3, Bouverie-st., E.C.
Printer for West Indies.—J. Haddon, 3, Bouverie-st., E.C.
Operator, clever all-round.—H. Grant, 73, Newport-st., Swindon.
Operator, good at posing.—E. W., 36, Richmond-gardens, W. Kensington.
Gen. Assist. to print, tone, &c.—Mr. Villiers, Llandrindod Wells, Radnor.
Operator & Negative Retoucher, first-class.—F. G., *Photo. News* Office.
Printer, Toner, Vignetter.—C. D. Lavender, Tweedy-bldgs., Bromley, Kent.
Silver Printer & Toner.—W. W., 33, Tulse-hill, S.W.
Plate-Coaters, several.—21, Charles-st,, Royal-cres., Notting-hill.
Operator & Retoucher.—A. Pettit, Keswick, Cumberland.

Photographs Registered.

Messrs. VALENTINE & SONS (Dundee)—Photo. of Steamship "Austral."
Mr. W. MERRICK (26, Castle Street, Bristol)—Photo. of Mrs. Mary Slater.
Mr. LAMBERT WESTON (Dover)—Photo. of Yachts.
Mr. G. TAYLOR (Bishop Auckland)—2 Photos. of Sir George Elliott, Bart.
Mr. W. J. ANCKORN (Arbroath)—Photo. of Mortuary Chapel in Arbroath Cemetery.
Mr. E. WILLIAMS (Hawkhurst, Kent)—4 Photos. of "Leather Bottle" Inn, Cobham.
Mr. J. HUBERT (Mare Street, Hackney)—Photo. of Rev. Brook Picton.
Mr. A. H. HILL (Prestwood, Stourbridge)—2 Photos. of Tomb of the Earl of Stamford.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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PATENT OFFICE LIBRARY

CONTENTS.

DIFFRACTION OF LIGHT: ITS BEARING ON THE USE OF VERY SMALL STOPS WITH LENSES.

THE subject of the effect produced by the use of very small stops has been discussed in our paper during the past few weeks, two correspondents having, in connection with it, afforded us valuable information. As the matter is one of interest to photographers in general, we think a few words on the phenomenon known as diffraction, which is what produces the disturbing element noticeable when very small stops are used, may be of use to our readers. We shall try to explain the matter in the most simple manner.

It is not generally known how nearly complete is the analogy, as regards manner of propagation, between light and sound. It is supposed that light passes always in straight lines, that sound may travel round any corner, and, as a matter of fact, we know that we may hear a sound distinctly when there is an obstacle between us and the source of the sound, whilst we cannot see a light when there is any opaque object between us and it. The matter as here represented is, however, not strictly correct. The apparent difference is due to the enormous difference between the wave-length of sound and the wave-length of light. As a matter of fact, an object lying between us and a source of sound casts a sound shadow which is, in proportion to the wave-lengths, as well-defined as the light shadow cast by an opaque body. On the other hand, the rays of light which pass nearest to the edge of a body which casts a shadow are bent into the shadow (and, in fact, in all directions at right angles to the boundary line of the body), preventing the edge of the shadow from being abrupt even when the rays reaching the shadowing object are parallel.

To prove this experimentally, we have but to place ourselves where the sun is shining in the shade of any well-defined object—a house will do quite well—and, gradually approaching the edge of the shadow, to keep our eyes fixed on the portion of the limits of the object where the sun will appear when we have moved out of the shade. Long before we get into the sunlight we will see the edge of the obstacle brilliantly lighted; in fact, some of the sun's rays have reached us coming "round the corner."

It is precisely this bending of the rays which produces want of definition when a very small stop is used. We suppose the case of any lens with a stop of, say, a quarter of an inch diameter, and for the sake of simplicity, suppose that we place it opposite the sun, so as to get an image on the ground glass. We will now have a certain amount of light passing through this aperture. All which does not pass close to the edge of the opening will pass on to be deflected by the lens to form an image, but that which passes close to the edge of the aperture will be dispersed in all directions. The greater part of it will be deflected only a little out of the straight line, but some small portion will be deflected through a very considerable angle. If we were to look at the stop from the very edge of the space for the ground glass we would see a bright fringe round that side of the stop which is nearest us, and from which, therefore, there cannot possibly be any reflection.

It will be seen so far that a certain amount of the light passing through the aperture of the stop has been scattered in all directions, causing, of course, more or less loss of definition—making, in fact, the boundary of the image of the sun less sharply defined than it otherwise would be. Whether or not the falling off of definition is sufficient to be practically discernible will depend on the proportion of the scattered rays to those which have not been changed in their course. The total amount of rays passing through an aperture varies as the aperture varies. The amount of light diffracted, scattered, or diffused, varies as the linear measurement of the boundary of the aperture. Now we know that the boundary of the apertures of stops are the circumferences of circles, which of course bear a constant ratio to their diameters, and that, moreover, the *areas* of the circles vary as the *square* of their diameters. Now from this it follows that as we decrease the diameter of our stops we decrease this area in a quicker ratio than we decrease the linear measurements of the boundaries of the stops; so that the smaller the stop the larger is the proportion of scattered rays to those which pass on in the direct course. It follows that we must certainly reach a point where the scattered rays will form so large a proportion of all which pass though the stop, that a practical falling off of definition *must* ensue. Indeed, if we go far enough, we may have the greater number of the rays scattered, and fail almost to get any image at all.

Lest this last paragraph be not clear to all, we shall revert to an actual case, taken any measurement. We have supposed already a stop quarter of an inch diameter. Let us now suppose this replaced by one half that diameter; that is to say, one-eighth of an inch. The area of this latter circle is one-quarter that of the former, so that only one quarter as much light will pass through it. The circumference of a circle one-eighth inch diameter is, however, *one-half* that of a circle one-quarter inch diameter, so that whereas with the smaller circle we have only a quarter as much light passing as with the larger, we have half as much light scattered by diffraction; that is to say, we have twice as large a proportion of the light scattered.

A certain proportion of the scattered light is practically annihilated by a phenomenon known as interference, which we have not space to discuss here. This gives rise to series of rings around any point of light, which may be focussed with a lens. As, however, the proportion of light neutralized by interference bears almost the same proportion for all apertures to the total amount of the scattered light, it is unnecessary to take it into consideration.

It will be seen, from what we have said, that the effect produced in the way of loss of definition by diffraction, when very small stops are used, depends on the diameter of the stop alone, and is entirely independent of the focal length of the lens.

It will be farther evident that the limit of smallness permissible, before reduction in size tends to cause definition to fall off, instead of increasing, will vary with the qualities of the lens. If the lens be an indifferent one, reduction in the size of the stop will continue to increase definition long after, in the case of a good instrument, definition would have commenced to decrease. There must, however, be in the case of every lens some diameter of aperture to decrease, which will be to *decrease* definition. This is a subject for some of our mathematicians to investigate. Meantime, we may say that in practical work we have sometimes imagined a falling off in definition in the case of a fine lens of sixteen inches focus, with a stop one-tenth of an inch in diameter. We do not care, however, to be positive in this matter.

PHOTOGRAPHING A PISTOL BALL AND SOUND WAVES.

THERE is nothing absolutely novel in the photographing of a cannon ball during its flight, but such an experiment is ordinarily regarded as a mere curiosity.

Professor E. Mach, of the Physical Laboratory in Prague, has recently secured some remarkable photographs of a bullet during its flight, and has also obtained camera representations of other extremely transitory phenomena.

No mechanical exposing apparatus of the drop or spring-shutter type was used, but the required instantaneous exposure was secured by illuminating the object with the light of the electric spark. The ball was fired in the direction of a battery of Leyden jars, and in such a manner that it itself made the contact which produced the electric discharge serving to illuminate the projectile. In this way a far shorter exposure was realized than one could hope to attain by any kind of mechanical shutter. Professor Mach's experiments were made in a darkened room, and the objective remained uncovered during the whole of the time, but of course the plate only received the luminous impression of the instant when the ball was illuminated by the electric discharge.

The negatives are extremely small and transparent; but with a magnifying glass it is easy to distinguish the clear and sharp image of the projectile.

Not only has Professor Mach photographed the bullet in its course, but also the air streams which one may see over a Bunsen burner when bright sunlight is allowed to play on it; and, what is more surprising still, he has actually secured camera representations of waves of sound, these last being made visible by Toepler's method, in which advantage is taken of the irregular refraction of light by the air set in vibration by sound. It is to be hoped that by taking advantage of the intense and instantaneous light of the electric discharge, many physical phenomena may be registered by the camera; and we shall look forward with interest for further details of Professor Mach's experiments.

WATERPROOF VARNISH FOR PAPER.

IN very many cases waterproof varnishes are useful, and among their uses may be mentioned their application to laboratory labels, and their use for the fixing of drawings.

There are many such varnishes, but, according to our own experience, one of the best is a thin solution of gutta-percha in benzole, and such a varnish may be made by dissolving one or two parts of fine gutta-percha foil in a hundred parts of benzole. The heat of a water bath serves to make the gutta-percha dissolve tolerably quickly, but if it is necessary to have the preparation at once, the gutta-percha may be dissolved in a little chloroform, and this is then mixed with the required bulk of benzole. Paper which has been coated with this varnish can be easily written, drawn, or painted upon; and it must be remembered that the gutta-percha varnish does not make the paper transparent or spotted. It is known that gutta-percha slowly oxidizes in the air, and becomes converted into a brittle resin; but this oxidation product is itself a waterproofing agent.

Alcoholic solutions of resins tend to make papers more or less transparent, but the following varnish, prepared with acetone, is not subject to this drawback.

One part of dammar is dissolved in six parts of acetone, the materials being allowed to digest together for some weeks: the clear liquid is now decanted off, and mixed with its own volume of plain collodion.

Another method of making a waterproof varnish for paper consists in digesting 30 parts of white shellac with 300 parts of ether, and then agitating the solution with 15 parts of finely-powdered white lead; on filtering the solution, it will be found that the white lead has been very effectual in clarifying the solution.

The above resinous varnish gives more lustre than the gutta-percha varnish, but the latter gives far more flexibility, a considerable advantage in many cases.

Not only silver prints, but also collotypes, and often photo-mechanical impressions, may often be advantageously treated with one of the above varnishes; and it must not be forgotten that anything which protects a silver print against damp serves to diminish the tendency to fading.

THE INTERNATIONAL CONVENTION FOR THE PROTECTION OF INDUSTRIAL PROPERTY.

THE Governments of Belgium, Brazil, Spain, France, Guatemala, Italy, Holland, Portugal, Salvador, Servia, and Switzerland, have constituted themselves into an Union for the Protection of Industrial Property, and it has been arranged that the subjects or citizens of each of the contracting States shall, in all the other States of the Union, as regards patents, industrial designs or models, trade marks and trade names, enjoy the advantages that their respective laws now grant, or shall hereafter grant, to their own subjects or citizens.

Consequently, they have the same protection, and the same legal remedy against any infringement of their rights, provided they observe the formalities and conditions imposed on subjects or citizens by the internal legislation of each State.

Subjects or citizens of States not forming part of the Union, but who are domiciled or have industrial or commercial establishments in the territory of any of the States of the Union, will be treated as subjects or citizens of the contracting States.

Any person who has duly applied for a patent or trade mark in one of the contracting States will enjoy, as regards registration in the other States, a right of priority during the periods of six months for patents, and three months for industrial designs. A month longer is allowed for countries beyond sea.

The introduction by the patentee into the country where the patent has been granted of objects manufactured in any of the States of the Union will not entail forfeiture. Nevertheless, the patentee will remain bound to work his patent in conformity with the laws of the country into which he introduces the patented objects.

Every trade mark duly registered in the country of origin will be admitted for registration, and protected in the form originally registered in all the other countries of the Union, and that country will be deemed the country of origin where the applicant has his chief seat of business.

Each of the high contracting parties must agree to estab-

lish a special Government department for industrial property, and a central office for communication to the public of patents, industrial designs or models, and trade marks; and an international office will be organized under the name of "Bureau International de 'Union pour la Protection de la Propriété Industrielle." This office, the expense of which will be defrayed by the Governments of all the contracting States, will be placed under the high authority of the Central Administration of the Swiss Confederation, and work under its supervision; its functions to be determined by agreement between the States of the Union.

States which have not taken part in the Convention will be permitted to adhere to it at their request.

Such adhesion must be notified officially through the diplomatic channel to the Government of the Swiss Confederation, and by the latter to all the others. It will imply complete accession to all the clauses, and admission to all the advantages stipulated by the present Convention.

Time alone can show how far the new Convention will work advantageously for the interests of trade; and although in its constitution there is no special reference to property in photographs, we have no doubt that if it be found that this class of property does not come within the letter of the Convention, arrangements will be made to include it.

By-the-Bye.

THE CAP, THE SHUTTER, AND THE CLOTH.

Workers by the old processes, such as calotype and waxed paper, had seldom occasion for a quick-shutter, and even lens caps were occasionally discarded, the exposure being made by simply drawing the slide of the dark back, and leaving the camera during a sufficient number of minutes.

About twenty-five years ago, when people had learned to look without special wonder on the so-called "instantaneous" street views, an occasional picture of breaking waves, or a ship under sail, there was a similar seeking after new exposing arrangements to that which we have experienced in the present day, and most of the shutters which have recently been brought out as new are mere resurrections of old and almost forgotten forms; but among the shutters of a quarter of a century ago, the simple drop found most favour, an india-rubber band being used to give it quick speed when a short exposure was desired; and a very common method of releasing it was to apply a lighted match so as to burn through a fine thread which held the shutter back. The revolving disc shutter was described and advocated by Mr. Sutton, while the double-slide shutter, known as Noton's, in which two diamond-shaped openings cross each other, was made by Mr. Hockin. Yet, in the face of these, which are fairly typical of shutters as existing at the present time, it is interesting to find that the most successful instantographers of twenty-five years ago rejected all mechanical shutters, and exposed with the lens cap or the focussing-cloth.

But we can now work in a fraction of the time we could a quarter of a century ago—certainly we can, and occasionally do—but the general exposure for an instantaneous street view is now, as it was then, about one-tenth of a second; and such an exposure can be very well given without resorting to highly complex mechanical arrangements or cumbrously long drops; but when a much quicker exposure is required, some mechanical aid becomes a necessity.

Before proceeding to fix to his camera an intricate piece of cog and lever work, about equal in weight to a complete quarter-plate outfit, the beginner would be wise to learn how far he can do all that he may require with the simple cap or the focussing cloth. As regards the cap, it is generally advisable to work with two caps rather than with one, as immediately the first is removed, the second can be slipped over the lens—neither should fit too tightly—and the extra cap is useful for protecting the back of the lens in travelling, as most lenses are now made with the mount of the same size at each end.

Then, again, the focussing cloth may be used either in its normal condition, or with a round hole about the size of the lens-mount cut in it, this hole being rapidly drawn over the objective. Need it be said that the cloth must be of a sufficiently dense material to allow no light to pass, and we have found a piece of fine broadcloth to be very much better and more convenient than velvet.

Only one step removed from the plain cloth is the excellent arrangement proposed by Dr. Vogel, and one which in skilful hands will give a really short exposure—let us say, one-fiftieth of a second—and this without shaking the camera.

The Vogel exposing arrangement consists merely of a tube or sleeve of black material fastened over the lens, and allowed to hang loosely down until the moment for exposure arrives; the open end is now gently and quickly lifted up and passed over the top of the camera.

FIG. 1.

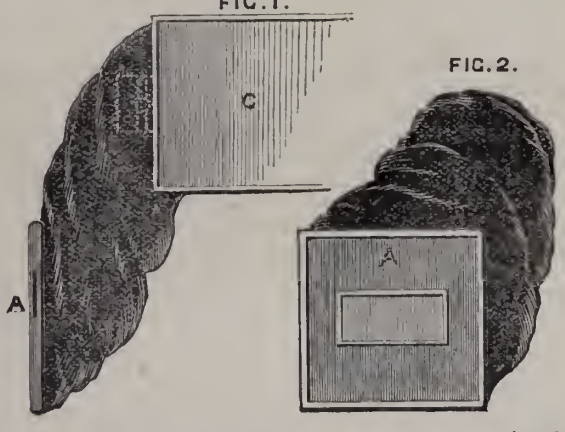


FIG. 2.

The open end of the sleeve at A is represented in the drawing as being fitted with a wooden frame; but it is better to use a rectangle made of the light U-section steel of which umbrella ribs are made, and a very thin black material indeed will serve for the body of the sleeve if the precaution be taken to attach an extra thickness or so to those parts which cover the lens when the sleeve is at rest.

Excellent, light, and convenient as this arrangement is, it has serious defects; defects which will not only much lower it in the eyes of many amateur photographers, but will also tend to prevent the dealer in apparatus supplying it to his customers—it is neither complex nor expensive, hardly worth either buying or selling.

To use the cap, the cloth, or the Vogel sleeve with the best result requires a certain amount of personal dexterity and skill; but the skill is by no means difficult to attain, and the amateur who goes out viewing with such simple exposing gear as we have described, has nothing to fear from damage to his shutter while travelling.

We do not mean to say that of all mechanical shutters, the simple drop is the very best, but we may say with truth that it possesses many important advantages over most of the very highly complex arrangements over which inventors have so much exercised their brains. There is not much chance of its being broken or damaged by careless handling, unless it be that the long slip of ebonite or wood which forms the dropping-piece may be snapped in two if negligently packed in the tourist's knapsack. But what is easier than to make a substitute out of a sheet of cardboard blacked with ink, and made to run easily in the groove by the application of a little black-lead to the edges? Then, again, how simple a matter it is to so far quicken the action of the drop-shutter as to make it give the shortest exposure one is likely to require, or to retard it so as to

make the exposure a third or a fourth of a second; elastic bands being applied in one case, and the shutter-frame being turned over into an oblique position in the other case.

The more highly organised shutters are all very well sometimes, and it may be a satisfaction to know that the instrument opens from the centre, or that by inspecting a scale one can learn the exact fraction of a second during which the exposure lasted; but it is well to bear in mind that every additional complication means increased risk of damage in use, and adds to the probability of something being out of adjustment just at the moment when one wants the shutter to do its work.

PINHOLES IN NEGATIVES.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

The season has now come when many of our photographic brethren will be taking themselves to the bracing air of the Alps, or to the more torrid climates of Belgium, France, and the Continent generally. Pedestrians, whether they carry their cameras on their shoulders, or have it carried for them either on mule-back or by porter, may now and then meet with a photographic experience far from pleasant, and which may mar the pictures which would otherwise be technically perfect. That experience is a peppering of pinholes all over the plate, and more particularly near the margins. The plates may be dusted before putting in the slides, and they may be dusted before development, but yet these plagues put in an appearance, and their very shapes and sizes clearly indicate that they are due to dust. No one who has traversed such a road as that between Vispach and Zermatt on a dry day will be astonished at dust being found in the slides. Foreign dust seems to penetrate everywhere, and to be ankle deep. To escape from it one almost prays for the advent of a storm, and would certainly do so if the dust were not immediately turned into slippery slush. Anyhow, such dust has to be faced and battled with, and the question arises, "How to do so?"

A camera case is no protection; in most instances, dust penetrates into it, and from it into the slides, so something more must be found to cope with it. Very thin rubber sheeting bags with flaps, which can be securely tied, just fitting each slide, the opening end of the slides being first inserted, are a great protection. But even these are not sufficient. The dust will work itself even through these. Of course, if you have your slides securely packed in a portmanteau, or leather travelling bag, and wrapped in clothes, or other such protecting articles, no further precaution is necessary. But then there are usually on such dust-formed roads "bits" which the photographer may wish to secure without unpacking all his articles of toilette, so that such a security becomes impracticable.

There is one golden recipe against dust spots which we can recommend. Take a little glycerine on a rag, and rub the inside of your slides and the rebating well with it, and then rub off as much as possible with a dry cloth. It will be found that sufficient is left on the wood to secure the adhesion of all the fine dust which may try to find its way to the plate. A recent experience showed that so much dust was collected, in some cases, that the front board of the slides almost refused to draw out, and when they were drawn, the inside surfaces and rebates were found covered with minute particles, which, without the glycerine, would doubtless have lodged on the plate. A handkerchief carefully removed the dust, and the slides were ready for fresh occupants. The plates developed free from all pinholes, and the cure was complete. To make the deductions here given doubly sure, one slide was kept unmoistened with glycerine, with the result that the plates were covered with pinholes, showing that the right tack had been taken in applying the glycerine to the others.

The attention of our readers is drawn to this mode of combatting one of the evils to be met with in their travels when pursuing our fascinating art.

THE SPECTROSCOPE AND ITS RELATION TO PHOTOGRAPHY.

BY C. RAY WOODS.

XI.—The Diffraction Spectrum.

Hitherto we have only considered the spectrum produced by refraction—that is, the effect produced by a narrow beam of light passing through a prism, the rays being more or less bent out of their course according to their wave-lengths. In Art. No. III. it was stated, however, that this was not the only method of obtaining a spectrum. The other method depends on what is known as "interference."

If two stones be dropped into a pool of water, each one gives rise to a series of waves propagated in all directions. It will be noticed that when the two circles meet, where the summits of the two sets of waves coincide, they reinforce one another. On the other hand, where the summit of one wave coincides with the depression of another wave, there is comparative quiescence; the particles of water at that place are being acted on by two forces working in opposite directions, their resultant depending, therefore, on their difference. This "interference" is to be met with in all kinds of wave motion—in sound, for instance, where the interference of the waves gives rise to what are known as "beats" in music. A similar phenomenon takes place when light waves strike a thin film, such as a soap-bubble. Some of the waves are reflected from the surface of the film; others penetrate the outside of the film, but are reflected from the inner surface: if one such wave emerges half a wave-length behind the other, the two waves mutually destroy one another. But as a ray of white light is made up of a number of ethereal vibrations of different wave-length, a film whose thickness is suitable for producing interference with one set of vibrations will not produce interference with vibrations of a different wave-length; some vibrations, therefore, destroy one another, and by their absence from the rays which finally reach the eye, give rise to colour.

Again, if a series of waves—such, for instance, as may be set up in a pool of water—meet with an obstacle, a new series of waves is set up at that point. Hence the facility with which water or sound waves turn a corner. Light, however, is usually regarded as travelling only in straight lines, and it was this general experience that was the great obstacle to the acceptance of the wave theory of light. Newton contended that if light was due to wave motion, the waves should bend round opaque bodies, and produce the motion of light behind them, just as waves of water wash round a rock. It has since been shown that this does actually take place, but the amount of interference is so great as to render it unnoticeable except under favourable conditions.

The "diffraction" or bending round of light-waves can be shown in a number of ways, but it is proposed here to give only a few simple experiments which can easily be performed by the photographer in his darkened room, and which will readily demonstrate the action of the diffraction gratings used by spectroscopists.

Take a piece of tinfoil, and, with thin gum or gelatine, attach it to a piece of glass. Now draw a sharp knife across a portion of it; this will give a fine slit. Place a lighted candle at one end of the room, and retiring to a distance of four or five yards, hold the tinfoil in front of the eye, with the slit perpendicular, covering the slit also with a piece of red or ruby glass. The flame of the candle, appearing of course red, will be seen considerably broadened out, and at each side of it a series of bands of red separated by intervals of darkness. Now replace the

red glass by a piece of blue; the blue bands will appear narrower and closer together than did the red. If no coloured glass be used, a series of spectra appear, the blue ends appearing nearest the central flame.

If the room is a very small one, it is advisable to place a slit in front of the candle also. This slit need not be narrower than one-sixteenth of an inch for observations at about two feet distance. Or, again, a piece of tinfoil may be fixed on the glass of the dark-room lantern, and a fine slit be made with a sharp penknife; observations through the other slit may then be made at a few inches distance.

For an explanation of what takes place, let us consider theoretically what should be the result of the interposition of an obstructive body in the path of the waves.

In the accompanying diagram we have a series of waves coming from a luminous point in the line B A produced.

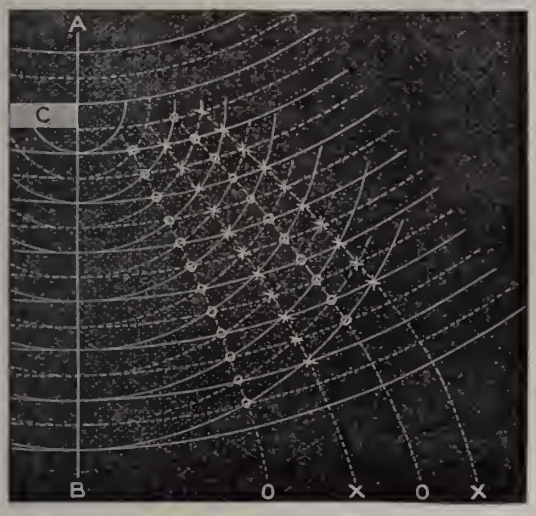


Fig. 13.

The summits of the waves are represented by continuous lines, and the depressions by dotted lines. Where the diffracting body C comes in, we have another series of waves sent up, meeting the original waves. At points marked O, where a continuous and a dotted line meet, we have two waves of conflicting phase tending to mutually annul one another. At the points marked X, where the waves are in the same phase, they strengthen one another, producing alternate spaces of light and darkness.

This is a simple case. In the experiment detailed, we have two such diffracting bodies, viz., the two edges of our slit, giving us a series of light and dark spaces on each side of the bright space in the centre. By somewhat complicated diagrams, it could be shown that the distance apart of the two edges of the slit would have an important effect on the appearance of the diffraction images. This effect can be best shown by a simple experiment similar to that already detailed.

Take the piece of tinfoil on glass, and cut with a sharp penknife a slit of gradually increasing width, that is, slightly wedge-shaped. On looking at the candle through different parts of this slit, it will be noticed that the wider the slit the narrower the spectra appear, and the closer together are they.

In the diffraction grating we have not one slit only, but a series. A number of fine lines are ruled by means of a diamond upon glass or speculum metal, at equal distances apart, this being regulated by a screw. Gratings containing as many as three thousand lines to the inch have been produced by photography; but this is far below the number that can be got into that space by mechanical methods. The lines, whether produced by photography or by the diamond, and if by the latter, whether on glass or on a reflecting surface, act as so many opaque edges to set up secondary waves, which, by meeting the original waves which pass through, are reflected from the intermediate spaces, produce a series of spectra. If the lines are far apart the dispersion is small, if close together the dispersion is considerable, as in the experiment with the wedge-shaped slit. Whatever be the number of lines to the inch, it is of the greatest importance that the distances apart of the lines should be regulated to a nicety, or errors must come in.

The greatest advantage that the grating possesses over the prism lies is the fact that the wave length of any particular line is easily determined by it. It is only necessary to know the distance between the scratches and the angle between the axes of the collimator and the observing telescope, and the wave-length may be obtained by a simple calculation.*

The grating is becoming of more importance than ever since Professor Rowland introduced his grating ruled on spherical surfaces. For photographic purpose no lenses whatever are required with them, and steps are being taken to bring them within the reach of those who may require them. At present, however, the demand is greater than the supply. There is no reason why, before long, the photographer should not be able to get a very efficient spectroscope for a very small outlay. In the next and concluding article, therefore, when reference will be made to the use of photography in spectroscopy, a brief description will be given of the simple mechanical arrangements that render the Rowland grating so easy of manipulation.

IN SEARCH OF THE PICTURESQUE.

BY H. P. ROBINSON.

When the east winds are over, April wanes into the merry month of May, and the dweller in town feels an irresistible longing for a breath of the country; when the birds are in full song and the apple trees in blossom; when the trees are putting on their summer verdure; when in pasture and wood and lane and by the river it is song and music, blossom and perfume everywhere;

> "When Beauty walks in bravest dress,
> And, fed with April's mellow showers,
> The earth laughs out with sweet May-flowers,
> That flush for very happiness";

then that photographer, whether professional or amateur, is to be envied who, finding he can spare a few days for a spring holiday, packs up his traps, and, perhaps with a fishing-rod tied up with his camera-stand, starts off into the country in search of the picturesque.

When Dr. Syntax went his famous tour on the same quest, he had not the advantages possessed by modern travellers for bringing home authentic reminiscences of his wanderings. In those days a meagre pencil sketch was often all that was possible for the amateur to obtain, while the most courageous artist seldom went beyond a timidly-tinted performance—every effort in art and literature was a performance then—in weak water-colours or neutral tint, and these were of a very unreliable character, giving but a poor idea of the places they were intended to represent. We have changed all that. The camera enables the novice to secure, if not perfect photographs, at least accurate representations that all will believe in, of the most remarkable scenes he meets with in his journey; while the more skilful will collect, not only the most striking views, but will also find simple scenes that have nothing to recommend them but the best of all qualifications, their beauty. Where the sketcher of old time did his one sketch, the modern photographer exposes a dozen plates; the range

* $\sin \delta = n\frac{\lambda}{d}$ where δ = observed angle
n = order of the spectrum
d = distance between scratches
λ = wave length.

also is more extensive. In those days, not one in several thousand could afford to do more than the "grand tour," then an affair of months, but now nothing but a slight excursion for an Easter holiday; but in our time photography garners its crop from the uttermost ends of the earth.

I often wonder why some photographers should consider it essential to travel so far after the picturesque. There are those who cannot see anything beautiful within many miles of home, while others find a picture at every turn. It is a saying of a well-known artist, that there is quite enough beauty at your own back-door, if you had only the power to see it, to provide materials for many pictures. He perhaps does not mean this to be taken quite literally, but merely as an illustration that it is the want of artistic insight, rather than a lack of objects, that compels photographers to travel afar for food for their cameras.

It is not difficult to see a view, but it is not so easy to see a picture in it.

It is this power of *seeing* a picture that makes the artist. Partly a divine gift, it is yet to be fairly acquired by study, and the more a photographer knows of what are the elements or constituents of pictorial effect, the more will beauty display herself to him, and, as Browning makes one of his characters say:

> "If you get simple beauty and naught else,
> You get about the best thing God invents."

It is fortunate that there are many different tastes and predilections in the followers of all arts. If we all thought alike, or preferred the same thing, the monotony of this world would be unbearable; but, happily,

> "To those who in the love of Nature hold
> Communion with her visible forms, she speaks
> A various language."

There are those who can only see beauty in inaccessible places, and care nothing for a picture easily obtained. I once knew a man who cared nothing for the most perfect effects if they gave him no trouble to reach, and went into raptures over an indifferent view obtained at some risk of his life. This is a curiosity of taste that I know is not an isolated example. Then there are others who only care for castles and abbeys and the usual stock subjects known as local views, and obtain at much trouble and expense, but with much healthful amusement which is worth any reasonable trouble or expense, pictures they could buy at small cost. But there are others who cannot see any beauty in their own country, but must go abroad for it, and are not content until they plant their camera where

> "Hill peeps o'er hill, and Alps on Alps arise."

All these do work that is useful and often beautiful. But my object, when I commenced to write, was to show that there is as much material, and of as good quality, in our own country as can be found elsewhere. There may be more magnificent views, higher mountains, vaster distances, grander buildings to be found on the Continent than in England, and these have been wonderfully photographed. But as I write, there floats up to the surface of the memory many a simple scene "by ruin, rock, and river," or in quiet country lanes, in farmsteads and meadows, of haymaking and harvesting, of valley and heath-covered upland, of fields studded here and there with cattle, and of cattle cooling themselves in the quiet pool under the trees, and the combination of field and wood and sky, the stillness of water and the grace of landscape form, not unmixed with the simple incidents of country life, that have seemed to me to contain more poetic beauty than the whole world beside, from China to Peru. If we look round a photographic exhibition and select the dozen pictures having the most pleasing effect, we should find the majority of them are simple scenes from English nature. There is a quiet poetic touch in a "bit" of England that appeals to our feelings and seems to suit our art. Then the atmosphere! We hear constantly that foreign photographs must be so much better, because the air is so much clearer; but I never saw any landscapes taken abroad to equal, in all that goes to the making of a picture, the same class of subjects taken in our own country; and until lately there have been no painters of landscape to equal our own. It is a curious fact that most of the great French landscapists give up their bright skies and clear air, and prefer the more solemn effects, such as are only to be got on duller days when their climate more resembles ours, and there is atmosphere to separate their distances, and to give the poetic charm that cannot, possibly, exist without a little mystery.

All this may be called a mere question of taste. Well, perhaps it is, but I do not think it would be difficult to adduce other sufficient reasons why simple bits of nature make better pictures than "the mountain and the flood." In all the photographs of what is called magnificent scenery that have come before us, the very quality on which the scene depends is absent. The sense of vastness or sublimity is not there. Why this is so, is difficult to explain. It is not that the effect cannot be given in black and white in a small space; for Turner, in his vignette illustrations—such as those to Rogers, Byron, or Scott—manages to put into a few engraved square inches, miles of scenery, expressing all the magnificence and grandeur of the original nature. Photography as yet, except in rare instances, gives us only the literal facts of a landscape—the landscape of form, not the landscape of expression. Time and experience will alter this. We have made great advances in the right direction of late years. We seldom omit the sky now, and are beginning to recognise the value of atmosphere; we no longer want the microscopic details of things afar off, and we are beginning to feel our way to the poetic beauties of landscape apart from its prosaic facts; we are trying to see landscape with our own eyes, not only with that of the lens, and are on the way to make our tools obey our will.

So there is still hope that one may in time bring home scenes full of grandeur and majesty represented with some approach to the feeling with which the real scene inspires the spectator; but at present we must allow that simple scenes are most suitable to our art, and that the every-day life and scenery of our own country is as much, or more, adapted to picturesque effect than anything else in nature.

Photography represents the quiet nooks and corners of our own country fully and sufficiently, but when it tries to make pictures of grander scenes, there is always, however fine the forms, however perfect the technical photography, a sense of something wanting.

Notwithstanding all I have said, I do not wish to discourage those who prefer to go far afield for their subjects; they have their uses, they bring home to those home-loving people who, Shakespeare rather impertinently says, have ever homely wits, facts from abroad that are always interesting. My object when I began this little essay was to encourage that vast army of photographers who have to be content at home by showing them that they have a wealth of beauty around them that should be sufficient to supply food for their art for the remainder of their days.

MR. DEBENHAM ON "THE ILLUMINATION OF THE DARK ROOM."

BY C. RAY WOODS.*

At the last meeting of this Society, when Mr. Debenham read his paper on "The Illumination of the Dark Room," I brought up the result of a few experiments in connection with this discussion, but the lateness of the hour prevented me bringing them forward. I wish to do so now, and am desirous at the same time of drawing attention to a few points in Mr. Debenham's communication.

Here is the result of an experiment to which I referred in

* Read before the Photographic Society of Great Britain.

the discussion on Captain Abney's paper. A negative is formed of one or two thicknesses of orange paper and canary medium placed side by side. The common orange paper lets through, it will be seen, much more light than the canary medium. Here is a transparency taken by contact, the source of illumination being an ordinary paraffin candle at a distance of twelve inches. At a first glance the orange paper seems to have the best of it, but it will be found on closer inspection that the inequalities in its texture bring it down to about the same level as the canary medium. With two thicknesses the canary medium has a slight advantage in protective power, but the superiority of the orange paper in the illuminating power of the light transmitted is most marked. I show here a similar experiment with canary medium, orange paper, and the yellow paper which Mr. Debenham uses in his lamp. The latter is a thin paper of very uneven texture, but it is a decided improvement on canary medium. Three thicknesses transmit as much illuminating power as two thicknesses of orange paper, the two thicknesses of orange paper being the safer medium, though only slightly so. The weak point, however, in all papers and fabrics is that so much of their safety is due to *general* absorption.

Here is a comparison of orange paper with three coloured glasses. Holes were cut in a sheet of orange paper, a little smaller than the pieces of glass, but corresponding in shape. The paper was then placed on a gelatine plate, with the coloured glasses covering the holes. The edges of the plate were then protected with black velvet placed loosely round, and the whole presented square to a fish-tail gas flame at a distance of four feet. Where the plate was only protected by orange paper (which has already been shown to be about equal in protective power to canary medium, by gas or candle light) the light has had a considerable effect. A slight effect has been produced on the part protected by stained red glass. The second glass—an orange glass, sometimes called stained red—shows protective power very little superior to that of the orange paper. The third glass is a piece of very dense ruby, equal in tint to about *three* thicknesses of the ordinary ruby glass. The exposure was not sufficiently prolonged to produce any appreciable effect through it, but its safety is purchased at the expense of illuminating power.

I have here a piece of the stained red glass used in this experiment. A portion of the surface at each end had been removed, leaving the centre untouched.

Here is a plate which was exposed beneath it. The part protected by central portion of the glass remains untouched with an exposure sufficient to impress two ends. This slip of glass forms part of a large piece I obtained from a glass merchant at Kensington, and it is similar to the stained red glass used by Captain Abney, which was labelled "Chance's Stained Red." In his paper of March last, Captain Abney makes use of the expression—"I do not mean orange or flashed silver glass, which is often spoken of as stained red." Before making any experiments, therefore, Mr. Debenham should have endeavoured to obtain the precise glass which Captain Abney used. Instead of doing so, he obtained a glass which he himself describes as a silver flashed glass. In a communication to the Society in February, 1883, Captain Abney describes this silver flashed glass as unsafe, inasmuch as it lets through some ultra-violet rays. The reason why Mr. Debenham found cathedral green a more protective supplement to it than cobalt glass is therefore apparent. Cobalt glass lets these ultra-violet rays pass through, and cathedral green cuts them off. I may here mention that the rays which produce the greatest effect on bromide of silver are generally recognised to be in the dark blue, not in the violet and ultra-violet, as Mr. Debenham states in his communication. In the experiment by which Mr. Debenham endeavoured to show the inferiority of stained red glass to canary medium, had he used the glass recommended by Captain Abney, he would have obtained some such result as I now pass round. Here stained red shows itself superior to orange paper, orange paper to canary medium, canary medium to orange glass, whilst the thinner flashed silver appears very bad indeed. This was taken by lamplight, and is a fairer test than that given by Mr. Debenham, for photographers do not use a light so rich in rays of high refrangibility as that emitted by burning magnesium. But even when so actinic a light as that given by magnesium ribbon is used, the stained red holds its own, and the others appear in the same order. As might be expected, a much stronger impression has been produced through the orange glass on account of the richness of the light in ultra-violet rays.

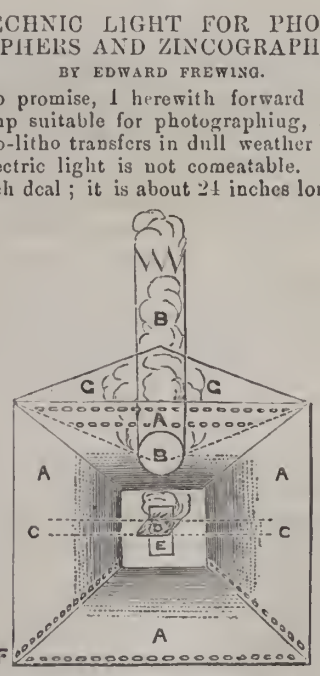
One word in reference to green glass. I have seen no green glass that does not let any blue light through, and photographers will do well to follow Mr. Debenham's advice to take "obvious precautions" when using a lamp part of the light from which comes through green glass unsupplemented with any other colour-absorbing medium. In Mr. Debenham's arrangement for using two lanterns, one glazed with orange-red, and the other with green, the approximation to white light is produced not by the mixture of red and green rays only, but by a mixture of red, orange, yellow, green, and, in a lesser degree, blue rays. Such a mixture of coloured rays is not unlike that which passes through canary medium, excepting that it contains a larger proportion of blue rays, and is, therefore, less safe, and, at the same time, whiter.

I beg, finally, to refer to a previous discussion in this room, when Mr. Debenham corrected me for making use of the expression "cathedral green;" I have since found that that expression is in common use amongst glass merchants, one of whom showed me a transparent glass which he called "cathedral white." As I see such glasses are quoted in Chance's lists as "cathedral tints," *not* "tinted cathedral glass," I consider that myself and others who have spoken of "cathedral green" were perfectly justified in using the expression.

A PYROTECHNIC LIGHT FOR PHOTO-LITHOGRAPHERS AND ZINCOGRAPHERS.

BY EDWARD FREWING.

According to promise, I herewith forward you a small sketch of lamp suitable for photographing, and printing zinco or photo-litho transfers in dull weather or at night, where the electric light is not comeatable. The lamp is made of ½-inch deal; it is about 24 inches long from front



A A A A, Wooden box, whitewashed inside; B, Chimney to carry off fumes; C C, Two wires to carry fire saucer; D, Fire saucer; E, Door in back of box for inserting fire pot; F, Ventilation holes, to make draught up chimney; G, Holes to take off smoke above glass.

to back; the front 18 inches square, the back 10 inches square; a glass in front, and a door in the back, and it is whitewashed inside.

To make the fine composition (pyrotechnic) suitable for the lighting of the picture to be copied, take o

Nitre	...	...	...	17 pounds
Sulphur	...	...	...	6 ,,
Orpiment	...	...	...	2½ ,,

Finely sift each separately, and then mix carefully together with the hands until thoroughly mixed together; the better they are mixed the steadier the light.

To copy a 15-inch picture (line) down to a 12-inch for the above process, about four to six ounces of the mixture is put into the iron pan and ignited, and the reduced wet-plate negative will be finished, as far as the exposure goes. It may be printed, if frame is held close to the glass of lamp, with about four times the quantity of fire used in four batches.

I trust this may be of some use to some of your readers, as it often has been to me. But care must be taken to avoid inhaling the highly poisonous arsenical fumes resulting from the orpiment.

Notes.

Dr. Koch, whose photographs of bacteria have contributed so much to our knowledge of the lower organisms, is now at Toulon making investigations regarding the cholera.

Photographers will hear with equanimity that the Works of Fine Art Copyright Bill has been withdrawn. As we pointed out some weeks ago, the Bill was framed simply in the interests of print-sellers. Photographers had not been consulted in the matter, and every reference to photography in the measure was confined to all manner of pains and penalties for infringement of certain clauses. The collapse of the Bill is probably due, to a great extent, to the vigorous onslaughts of the *Pall Mall Gazette*, which pointed out clearly that the only section of the public benefitted would be the Print-sellers' Association.

The Berlin Society proposes to inaugurate a competition for out-door outfits, and to offer two silver medals and two bronze medals. There are two classes, the first comprising complete outfits and apparatus to be transported by beasts of burden; while the second class is to include portable arrangements for pedestrians. Articles for competition may be sent to Dr. Fritsch, 35, Dorotheenstrasse, Berlin, N.W.

An exceptionally interesting paper which Mr. Purdon Clark recently read before the Society of Arts dealt with the street architecture of India, and the lecturer showed on the screen some excellent transparencies taken from his own negatives; We are glad to see that photo-lithographic prints from these negatives (sixteen in number) were issued with the last number of the *Journal of the Society of Arts*. We do not find, however, that the production of the prints is accredited with his work.

Amongst the multiplicity of labours carried out during the past year at the British Museum, Professor Sydney Calvin, the recently-appointed Keeper of Prints and Drawings, announces that 4,919 prints, drawings, and carbon photographs have been impressed with the departmental stamp. In all, 6,012 prints, drawings, and photographs have been acquired during the period named. Of the photographs, the most important were 50 by M. Braun, of Dornach, of celebrated pictures in the Madrid Gallery.

M. Braun has for some time been engaged in preparing these carbon photographs of the master-pieces of the Spanish National Collection, and the above form Part 8 of the series.

But a much more important photographic event has been the arrangement, in the second Northern Gallery—which, as visitors to the Museum will recollect, used to be filled with the stuffed specimens of the Zoological Department, now removed to the new National History Museum at South Kensington—of an admirable selection of carbon photographs of original studies by Raphael, Michelangelo (for this is how Professor Calvin insists on writing the great sculptor-painter's name), Leonardo da Vinci, and other great Italian masters.

These valuable examples do not fill the Gallery, the remaining space being occupied by Autotype reproductions of early Italian and German prints. A guide to this exceedingly interesting exhibition has been issued, we notice, by the Museum people.

Three powerful electric lights shone from the stage of Baldwin's theatre in San Francisco, and so bright was the light that the ladies held up their fans, and the gentlemen covered their faces with their hats, while photographs were taken of the visitors.

Several cameras were at work, and each person who had taken a ticket in advance received a print. Our managers might take a hint.

One of the worst sitters is a young officer who has just dressed himself in his regimentals; and the photographer who can make a picture of such a subject, in spite of the conscious dignity of the youth, and the bright unbroken surface of his newly tailored attire, must indeed be an artist.

Among the most valuable properties of the art photographer may be mentioned old clothes; and although the infant who is brought in the full glory of starch and stiffness may be readily re-attired in soft and coffee-tinted garments, no such course is practicable with the young officer.

The Emperor of Brazil, that exemplary potentate who, when in London, used to so upset the staff at Claridge's by getting up at 4 in the morning, and doing a hard day's sight-seeing before breakfast, is known to be a monarch of liberal views and exceptional enterprise. He is always introducing vagaries into his Empire, and he now intends, it is said, to apply photography to the postal service.

Photographic postage stamps will be doubtless interesting to collectors, but that they will prove a practical success is not at all clear.

The late Mr. Charles Reade had a craze that all that was right about the human body should be left. He proclaimed that the left side of the face was the right, that "artist's always put the best touches, finest shading, and most delicate tints on the left side of the profile." Photographers have long since found out that one side of the face is gener-

ally better than the other side, but is it invariably the left side which is better? Mr. Francis Galton might well incorporate this enquiry in the data that he is collecting about family history.

It was a photograph representing an extraordinary incident which really happened some time ago at Brompton, near Chatham. A horse had taken fright and bore its rider on to some railings which bordered a stable-yard situated some thirty feet below the level of the road. The horse leaped the railings and came down over twenty feet on to a wooden landing, from which steps ascended to the road. The rider kept his seat, and, strange to say, neither man nor horse was hurt in the least. The photograph of the scene is kept hung up in the bar of a suburban public-house, and of course excites much wonder. The other day two men were looking at it. One said: "Well, I've heer'd about instantanerous photography, but that's about the instantanerousest picter I've ever seen. Why, its got the 'oss actooally a-leaping the rails." Says the other: "Ah! but what beats me is as the photographer should ha' been there at the very time and got everything ready to take the picter." If the critics had known that a large photograph of the surroundings had first been taken, the man and horse painted in, and the whole photographed, then they wouldn't have been so much puzzled.

Photographers play very "low down" in the State of Kansas. At Kansas city in the finest street are to be seen notices, "tintypes ten cents." No wonder a member of the Chicago Photographic Society was compelled to say that this did not heighten his idea of photographers.

The close competition the German paper manufacturers are running against the English manufacturers, to which we alluded in a recent issue, is not confined to photographic papers. Mr. Fawcet had to own in the House of Commons the other evening that paper for post cards was now procured from Germany cheaper and better than it could be supplied in England.

Sulphite of soda as sold frequently contains carbonate of soda, and many persons spoil their work by using such sulphite in the developer. The salt is often prepared by dissolving a quantity of carbonate of soda in warm water, and after saturating the liquid with sulphurous acid, a quantity of carbonate of soda, equal to that first used, is added. If, however, the amount of sulphurous acid first used was not sufficient to entirely convert the first quantity of carbonate of soda into bisulphite, the resulting sulphite will be contaminated with carbonate, and may cause mischief if used in the developer.

The best method of testing a sample of sulphite is to add nearly sufficient of a strong acid to convert the salt into bisulphite, and to notice if any effervescence occurs. If effervescence takes place, carbonate of soda is present, and the sample of sulphite should be rejected.

Now as to the exact method of testing. First, put four drachms of the sodium sulphite to be tested in a glass flask; add six fluid drachms of water, and heat gently so as to cause the salt to dissolve. Allow the solution to cool down to about 85° Centigrade, and add a mixture of one fluid drachm of strong hydrochloric acid, and two fluid drachms of water. The slightest effervescence, or the formation of minute bubbles of gas on the sides of the flask, will indicate the presence of carbonate in the sulphite.

Judging from personal observation during a recent visit to the West of England, we should imagine that the Great Western, Paddington, and Exeter Express, known as "The Flying Dutchman," can claim the honour of being the "most photographed" train on the metals. In nearly every town bordering on the line we found that one at least of the local photographers had seized an opportunity, as the train flew by, to secure a likeness, which for once is none the worse, but rather the better, for being a "fleeting" one.

There is necessarily a sameness, however, about the series. An express engine has not the manifold facility of pose possessed by a "professional beauty" or a famous actress; and its expression, whether it be going at fifty-eight or fifty-nine miles an hour, is grimly the same. The only relief, in fact, to the similarity of the photographs is furnished by the change of background and the varied positions of the stoker and driver.

In an amateur performance of "Macbeth," in the small town of Lawrence, Mass., U.S.A., it is reported that a local photographer played the part of the wicked Thane. He commenced the famous soliloquy in Act II. thusly:—

> "Is this a 'Daguerre' which I see before me,
> Within my reach? Come, let me gaze at thee!
> I see thee now; and now I see thee not.
> What art thou, then, a thing impalpable,
> A changing vision, or a false creation
> Proceeding from my heat-oppressed brain?"

At this point, however, the stage-manager summarily intervened.

"When I used collodion in the house on Saturday afternoon last, there was quite a commotion, windows being thrown open, and suffocation talked of," says an amateur; but he tells us that in the old time, when he worked with ether nearly every day in the week, no remarks were made. Here is a touch of nature; but the home photographer has now the satisfaction of knowing that he is not quite such a nuisance as he was a few years back.

Mrs. Malaprop was amongst the ladies who braved the tropical heat of a London photographic studio last week, and, in spite of the precautions taken, was so overcome by the temperature as to show signs of collapse. But she insisted on completing the sitting, assuring the artist that she would "soon be all right if he would only sprinkle a little *eau-de-collodion* over her handkerchief."

Photography acts sometimes as a check to the imagination. The residence of Prince Bismarck at Friedrichsruhe

has long been an object of curiosity to the outside public, very few persons having seen little more than the chimney pots of the house owing to the high red-bricked wall which surrounds it. By permission of the Chancellor, a Hamburg photographer has been allowed to photograph the interior and exterior, and sixteen plates have been taken. Everyone, however, who has seen the pictures has been disappointed, as the supposed sumptuous mansion turns out to be an ugly whitewashed building with low windows without the least approach to ornamentation from top to bottom.

Patent Intelligence.

Applications for Letters Patent.

9612. Alfred George Brookes, 55, Chancery Lane, Middlesex, Fellow of the Institute of Patent Agents, for "Improvements in the method employed in the preparation of surfaces for printing or etching by the aid of photography." A communication to him from abroad by Edward Kunkler, St. Gall, Civil Engineer, and Jacques Brunner, Küssnacht, Zurich, photographer and art printer, both in Switzerland.—Dated 1st July, 1884.

9641. Richard Charles Wittmann, 47, Great Marlborough Street, Middlesex, glass and china merchant, for "Self-acting and self-supporting frames for fastening photographs to glass."—Dated 1st July, 1884.

9792. Robert Royou Beard, 33, Balaclava Road, Bermondsey, London, S.E., Engineer, for "The propelling and repelling and self-centering of photo transparences and views."—Dated 5th July, 1884.

Specifications Published during the Week.

4144. William Blair Anderson, 26, Union Terrace, Aberdeen, in the County of Aberdeen, Scotland, Photographer, for "Improvements in colouring photographic prints."—*Provisional only.*

I take unmounted print (which has been previously toned, fixed, and washed in the usual manner), mount it on plate of opal glass or other prepared surface. After pressing out all air-bells it is allowed to dry. Thereafter, the plate is heated, and bees'-wax, paraffin, naphtha, or other substance applied till the print is perfectly transparent. The superfluous wax or other substance is then wiped off with a cloth, and when cool, the print is gently polished with silk handkerchief or other suitable soft material, when it is ready for being coloured or painted in monochrome, which is done by the application of oil colours, according to the effect desired.

What I claim is:—The absolute and exclusive right to take an unmounted print (which has been previously toned and fixed in the usual manner), and to mount it on a plate of opal glass or other suitable or prepared surface, and after pressing out all air-bells and allowing the same to dry, to heat the plate and apply bees'-wax, paraffin, naphtha, or other substance, until the print is perfectly transparent. Then to wipe off the superfluous wax or other substance; and when cool and gently polished, to colour according to the effect desired, by the application of oil colours.

5681. William Robert Lake, of the firm of Haseltine, Lake, and Co., patent agents, Southampton Buildings, London, "Improvements in and relating to colour-printing, also partly applicable for producing coloured photographs and for similar purposes." A communication to me from abroad by Auguste Bisson, of Paris, France, Heliographic Engraver.

This invention relates to colour-printing, but is also applicable for producing coloured photographs and for similar purposes. The said invention comprises an improved method or process which is applicable to all kinds of photographic or other pictures, amongst which I will particularly mention the proofs obtained by means of carbon or salts of silver, such as those obtained by photoglyptic or phototype processes; these pictures may be portraits, reproductions of natural objects, or pictures of any other suitable description. The said method or process consists essentially in printing, impressing, or applying, in the special manner hereinafter described, the necessary colours either directly upon one or the other face of the gelatine film, bearing the carbon proof or the photoglyptic proof, or upon a proof obtained upon a translucid support, such as mica, vegetable parchment, dioptric paper, transparent mineral paper, and paper mounted upon cloth or the like, to which substances I impart complete transparency by means of an operation which I carry into effect either before or after the production of the picture. This operation consists simply in immersing the paper or other substance which is to be rendered completely transparent in a bath of varnish composed of the following ingredients, viz.:—

Volatile or rectified benzine ...	1000 grammes
Resin	150 ,,
Linseed oil	10 ,,

This mixture is prepared in a water-bath, and by a simple agitation which ensures an intimate mixture of the materials.

I claim—

First. The printing or impression of colours upon one or the other face either of the transparent gelatine film, of proofs obtained with carbon or by photoglyptic engraving, or of these proofs transferred upon perfectly transparent supports, or of photographic or phototypic proofs obtained upon paper or other equally transparent supports.

Second. The method of treating in a cold bath formed of rectified benzine, resin, and linseed oil, various partially transparent supports, such as vegetable, dioptric, or mineral paper, or vegetable parchment, in order to give to such supports a complete transparency.

Third. The method of successive printings or impressions by flat tints of the different colours to be obtained, by means of thin patterns made of opaque substance, such as metal, cardboard, or the like, which have been previously cut out to the exact outlines taken from a photograph of the picture, of the different shades to be produced, and which are applied upon a lithographic stone treated with bichromate of potash to obtain parts representing the exact forms of the tinted parts, and which are then imprinted successively on the proofs suitably registered and prepared in the manner above indicated.

Fourth. The modification of the method of printing, consisting in operating by hand, when only a few reproductions are required, by means of the cut-out patterns above indicated, which facilitates the rapid application, by flat tints put on by means of a brush, of the different colours which it is desired to obtain.

Fifth. The method of mounting the coloured proofs obtained as above indicated, upon Bristol-board, wood panels, or cloth, according to the appearance which it is desired to give to the picture.

7191. Alfred Julius Boult, of 323, High Holborn, in the County of Middlesex, Engineer, for "Improvements in rings for containing portraits or the like."—Dated 3rd May, 1884.

This ring is first opened at the top by raising the part under the bezel which carries the stone at the side opposite, then the two lateral lids are opened, or they open by themselves by means of springs. The portraits, figures, or the like are fixed in place by means of movable frames so that they may be placed into the ring or taken out at pleasure. The rings are made flat or half round, and a gold plate or a stone is placed upon the top lid as may be desired. The lids are attached by hinges on which they move. To close them the two at the sides are retained by the one at the top. To this end the latter takes into two little spurs or claws on the side lids, and keeps the same in place when closed. These rings are also made with two portraits only; in that case the side wings are dispensed with, and only the upper lid remains, this containing one portrait, the other being placed on the body of the ring. What I claim is—A ring for containing portraits, figures, or the like, as described.

SILVER PRINTS.

BY EDWARD DUNMORE.*

The paramount importance of ensuring permanency in our silver prints has induced me to put together a few notes, as supplementary to the interesting paper on "Fading" read by Mr. John Spiller at the last meeting of this Society. It will be well, in the first place, to decide upon the standard we are to set up as

* Read before the Photographic Society of Great Britain.

to permanency. Will a picture on paper, an engraving in fatty ink, *e.g.*, supply it? or are we to put silver prints in competition with flint or wrought-iron, expect them to resist boiling, or even soaking, in strong solutions of hyposulphite of soda without injury? The phrase permanent is very elastic, and at best is but an expression used to indicate durability, not by any means indestructibility; but, for all intents and purposes, if a silver print will remain good as when made if treated as most pictures of any value are treated, hung on the wall or placed in the portfolio, it in my opinion fulfils all the requirements that can reasonably be expected of it; what more do we seek? Many silver prints produced in the early days are as good and perfect now as they were then, no especial care having been taken of them, and not in only one or two isolated instances, but in many. Now it is an axiom that anything that can be repeated must be subject to certain rules, or the reproduction could not take place, therefore it is absolutely certain that if we knew the precise conditions attending the manufacture of these particular prints, by following the same routine exactly, we should risk no failure nor have fading prints; in fact, permanency would be assured.

As an aid to permanence, many years ago Mr. Spiller suggested the use of ammonia carbonate in the hyposulphite bath as assisting the solution of the unstable silver salts formed in the paper; at that time I was using carbonate of soda, but with a different intent. I had been complaining of the reducing action of the hyposulphite solution on my proofs to a brother photographer, who attributed it, as many faults were attributed in those days, to acid hypo. If this was the case, I thought the addition of a little alkali might remedy it, be a reasonable precaution, or, at any rate, do no harm. I made the addition of sodium carbonate to the hyposulphite bath, with a decided improvement in the results, for which I substituted the ammonium-carbonate after reading Mr. Spiller's remarks thereupon, and continued its use afterwards. About nine years ago I adopted it as an improvement at Mr. Bedford's works, and after using up a hundredweight or so of the ammonia-carbonate, discontinued it, finding that a whitish deposit was formed on the surface of the prints, which, though very slight, still injured their appearance, as the light fell upon them at certain angles. This deposit was loosely attached, a rub with a soft rag easily removing it, but the trouble incurred was considered to more than overbalance the advantages gained; the use of ammonia was in consequence discontinued.

We will now, for the present, leave the matter of permanency to consider of what in reality a silver print consists; a definite understanding on this point is very material to any argument that may result thereupon. To get an idea of this it will be necessary to sketch out the process of silver printing *ab initio*, taking the paper itself for a starting point. Photographic paper is, and has been from the first, almost exclusively supplied from foreign mills, the words Rive and Saxe being almost synonymous with photographic paper. This, the foundation of our prints, seems now somewhat inferior to earlier makes. The inferiority is not in appearance or texture, but in the increased difficulty of causing it when sensitized to retain its whiteness without extraordinary precautions, that were unnecessary at an earlier date; an hour or two in warm weather is sufficient length of time to gain a decided yellowness, when formerly, under similar conditions, the colour would be pure and white for a day or two. I am not sufficiently acquainted with the manufacture to suggest the reason, I can only record the fact. This seems to be the only portion of a silver print that is actually beyond the control of the photographer, if we except metal spots, which in the Saxe make of paper seem more numerous now than formerly; these are, however, local troubles, and have no effect on the permanence of the print, and are probably due to particles of metal abraded from the machinery during the process of manufacture, or hot-pressing afterwards, or rolling.

Albumenizing is the next process, which is now so seldom done by photographers that it is practically out of their control, although they could do it, if they so willed; and much depends upon it. This should consist of pure fresh egg albumen mixed with a definite quantity of some chloride, and applied to the surface of the paper, *secundum artem*. Ammonium-chloride is, I believe, generally preferred as giving a better colour than other salts. In addition to this, some makers add other substances for the purpose of increasing the gloss, or to improve the keeping qualities of the paper. Citric and acetic acid are added, more especially during warm summer weather. If albumen from blood or gelatine is used, mixed with or in lieu of pure egg albumen, imperfect results are more likely to occur, the proofs on such paper are wanting in richness and evenness of colour, acting themselves as a caution against the use of that particular sample of paper. Stale albumen is well known to give a higher gloss, but its offensive smell and doubtful qualities, as a rule, cause such paper to be rejected; prints upon it have, however, been found to remain bright and pure, as with fresh albumen, and to show no signs after the lapse of years, either of fading or yellowness. The paper, being albumenized and dried, is now floated on a bath of silver nitrate, of a strength of between 60 and 70 grains per ounce. The strength is, however, somewhat regulated by the amount of salt in the albumen, care being taken to have a considerable excess of silver salt. A large amount of uncombined silver nitrate facilitates both printing and toning. The prints are richer in colour, and tone more readily, and, to my thinking, if strong baths are used, are more permanent.

The paper thus prepared is dried and exposed to the light under a negative to make the positive print. The resulting action has been, and still continues to be, somewhat a matter of conjecture, but not less important on that account. A number of complex changes undoubtedly take place, and, according to various careful experimenters, the principal change is that the chloride of silver is reduced to the form of a subsalt and a red substance, which is left on decomposing the subsalt by hyposulphite of soda in the act of fixing. This is the theory set forth in "Hardwich's Chemistry." It is, however, somewhat incomplete, and will not account for the varying results continually brought before us; therefore, again adverting to the axiom that anything to be repeated must be subject to some definite rule, we undoubtedly require further knowledge of this particular part of the process. What, for instance, is the "red substance" that forms an important part of the photographic image? When silver nitrate is applied to organic matter, darkening of the substance takes place, not only in the light, but in the dark, the silver being reduced to a metallic state, light greatly accelerating the change, which bears some relation to the intensity of the light acting on it. Suppose, in addition to the subsalt theory already advanced, that the silver became reduced partly to a metallic state, and partly to a state of oxide, nitric acid being liberated. Many years ago M. Deville found that by acting on silver nitrate with chlorine, dry nitric acid was formed. Is it unreasonable to suppose that free nitric acid being liberated by the reduction of the silver nitrate to a metallic state, which, in its turn, is partly deoxidized by the light, the oxygen attacking the reduced silver, nitrous acid escaping and acting on the organic matter with which it is in such intimate contact that xanthoproteic acid results, which we know is of a deep yellow colour, and darkened by alkalies? This may form the basis of the "red substance" to which Hardwich refers.

The preservative effects of a carbonated paper on sensitized paper is well known, and the effect is especially noticeable when placed in the printing-frames at the back and in close contact with the sensitive paper during the operation of printing. Its preservative qualities are attributed to this power of neutralizing any liberated acid. In connection with this, I may remark that addition of a considerable quantity of nitric acid to the silver bath somewhat expedites the printing, and that the ready-sensitized, and some samples of unsensitized paper, contain a very large amount of free acid. The result tends, in all instances, to more rapid impressions. The silver print seems to principally consist of coloured organic matter, oxide of and metallic silver, previous to toning, which inclines me to the opinion that a silver print consists of *two entirely distinct images: one an organic, and the other of a metallic nature*, and that these images exist in varying proportions one to the other, and may be produced at will, depending almost entirely on the force and continuance of the light used in their production. With a weak light and short exposures, the image will be principally organic; with a long-continued and powerful light, metallic. This quality of the image seems to me to have been the stumbling block over which we have so long continued to trip, and will explain the varying amount of permanence in proofs prepared in a seemingly identical manner. The organic image is, I believe, the image that fades, and this idea is supported by a variety of evidence. For instance, the lasting qualities of prints from delicate and thin negatives that are printed in a very subdued light to get the best impressions are allowed, on all sides, to be less permanent than stronger impressions. For my own part, notwithstanding their attractiveness, I believe they are the most unstable of all photographs, and that such prints, without any doubt, no matter how carefully prepared, have but a short existence—ten years at the very outside, and frequently one or two. On the other hand

a strong metallic image—that is, one printed in a good light from a fairly dense negative, is, to all intents and purposes, quite permanent, if prepared with reasonable care. This theory of the quality of the silver print is not, if I may so term it, an upsetting theory, but merely an additional one. The ultimate forms that the varied and complex changes that take place lead up to, is the production of a metallic and an organic image intimately combined, which, although having different proportions one to the other, cannot exist entirely separate.

The next stage in the production of a silver print is the toning. The substitution theory is the one generally accepted—that is, the silver chloride is abstracted from the image, and its place supplied with gold; the double chloride of gold and sodium or calcium becoming, by enterchange of elements, the double chloride of silver and sodium or calcium, according to the salt used. If these reactions take place the abstracted silver should be found in the exhausted gold bath. May I ask if this has been satisfactorily determiued by actual experiments? I have heard this query put before, but have not heard the reply. Supposing, however, a somewhat different action takes place, and instead of the abstraction of silver from the image, each particle of metal becomes coated with gold, electro-plated, as it were, then an explanation is offered of the somewhat obscure changes that take place in this part of the process. An organic image would be obviously incapable of attracting deposit of gold, otherwise of being toned, and the attempt to make it would result in the partial or entire destruction of the image. Adopting this theory, it is easily understood why a print from a weak thin negative can never be made of a rich deep colour, the small amount of metallic image with which it is comoined being too little to attract sufficient gold, before the bleaching effects of the touing bath upon the organic image has partially obliterated the impression. If the image is strong and rich, printed from a fairly dense bright negative, the toning can be carried much further without this destructive effect taking place. By coutinuing its action the colour gradually loses its richness, but the image will uot be destroyed in any reasonable length of time. The effect is, however, precisely the same. The destruction of the orgauic image takes place more or less according to the depth of the impression; but there is sufficient of the metallic image present to prevent the dual image being altogether effaced. The orgauic portion acts throughout as a coloured medium, to which most silver prints owe their warmth and richness, and the metallic part, to which they owe their permanency. We find by actual practice there is no *necessity* whatever to carry the toning process past a certain stage to ensure permanency. Even by stopping short of the most *perfect effect with regard to permanency*, we get an impression that will be sufficieutly durable, so that there is considerable licence in the matter of colour, without incurring any particular danger. I think the very highest point to which toning can be carried with advantage is to stop it just before any reduction of the organic image takes place, known by the disappearance of half tones; to carry it further is at the sacrifice of richness and quality.

The desired colour being obtained, we come to the last chemical process the prints have to undergo—that is, fixing. To effect this, we immerse the prints, well washed from the gold bath, in a solution of sodium hyposulphite, or thiosulphite, as it is, perhaps, more correctly called. Much stress is to be laid on the importance of using freshly made solutions, and continuing the action sufficiently long to dissolve all that is soluble in the hyposulphite solutions from the paper. The time required varies with the temperature and the kind of paper—about a quarter of au hour to twenty minutes usually suffices. No exact time can be stated, a very thickly albumenized paper requiring longer than samples thinly albumenized. The print should look clear when held up to the light, showing the more opaque salts are removed. This part of the process, in my opinion, with a print rightly prepared in other respects, determines if it shall yellow and spoil, or remain bright and permanent. When the hyposulphite has effected its purpose and dissolved all those compounds we know, by experience, lead to after trouble, the proof must be thoroughly washed and dried. The results, I am firmly convinced, are permaucnt impressions, and, so far as I can see, this is the result at which we wish to arrive.

WHAT TO MAKE FOR ONE'S ALBUM.

THERE are so many pleasant and promising fields, and each one is, perhaps, in such a position, that he is tempted to enter upon some corner of it. In making a selection, he should first consider his opportunities. What places are most easily and most generally accessible to him? He should next consider his time. If time permit, inclination call, and opportuuities present, then he may enter a field with a view to success. For a busy man who has only mornings and evenings at his disposal, and a long summer vacation for uninterupted work, it would be folly to attempt portraiture. His progress would be so slow, and his opportunities so few, that his time would be in a great measure wasted. Such a person will usually find landscape work by far the most profitable, and a summer vacation will bring a harvest of good things.

Having selected a line on which the greatest atteution is to be devoted, something more is necessary. If the pictures are to have a connection and to illustrate a subject in the city, for example, the landscape photographer will find that series of subjects will give zest to his work, and possess considerable value.

A geutleman in Brooklyn and another iu New York have made views of the exteriors of the leading churches. Another has devoted himself to the interiors as well as the exteriors, and in this way formed a gallery of pictures which will become more and more interesting and valuable as time passes. A series of views of remarkable houses and buildings of a city would be a source of interest aud pleasure to the possessor. These would have artistic as well as historic value.

To the artist the picturesque points of a great city appeal strongly. In order, however, to make a very complete collection of such photographs, the artist should have some one to accompany him, otherwise he may find himself hampered by a crowd of the curious, which will be annoying, to say the least. When one has an iustantaneous apparatus this annoyance is, of course, reduced to a minimum, and he is comparatively independent of the curiosity of the omnipresent small boy and loafer. With such an apparatus, street scenes, celebrations, aud moving vessels offer few difficulties. The possessor will easily make a collection unique in its way. In a city like New York or Brooklyn, a most picturesque series of pictures can be made along the wharves and among the vessels; and with a little diplomacy a great many favours and much assistance may be obtained from the longshoremen and sailors in getting into favourable positions and finding suitable subjects.

The amateur photographer in the country will find the illustration of his town a work well worth all his energy. Morning and evening, winter and summer, all bring phases which the camera can render with peculiar advantage. If leisure enables him to take portraits, he can easily increase his collectiou by taking the more noted characters; and these, if introduced as figures into characteristic surroundings, will make a history of the most interesting description. Manners and customs can be illustrated, and picnics, weddings, and public gatherings made the subject of photographs.

The traveller has an opportunity to include in his album a great diversity, while at the same time a single purpose gives unity to his work.

A gentleman in this city has for some time past beeu illustrating his journies by photographs taken along the way. The engines which drew his trains, the hotels at which he stopped, views from windows, characteristic scenery along the way, the steamers, the landings, and in many cases groups of people, have all beeu worked up into effective pictures, which adorn his albums. Summer journeys which, previous to his adoption of photography, were mere idle rambles, are uow undertaken with a purpose, aud new reasou is added to each summer vacation, and he brings home with him a record of his tours intelligible to every chance visitor.

To many enthusiasts in photography such organization and systematic labour may seem useless. Their own interest and eagerness seem a sufficient reason for anything they may do. The pleasure of taking a negative, seeing it developed, and printing from it afterwards, appears to be a sufficient reward. This is true for a time; but they will find that as months and years pass by, unless some plan is adopted which they are anxious to carry out, their interest will flag to a greater or less extent, and they will perhaps see, when it is too late, that had they commenced in a different way they would still be obtaining as much enjoyment from their work as when they first commenced.—*Anthony's Photographic Bulletin.*

COMMERCIAL FABRICS SUITABLE FOR DARK-ROOM ILLUMINATION.

BY J. R. SAWYER.*

The tone of Mr. Debenham's paper, and the warmth of some of the observations that it elicited at its close, brought to my mind some remarks made by my friend Mr. Bird, at the meeting on March 28th, and which I will venture to quote. Mr. Bird said:—"The great discrepancy between the scientific evidence and the experience of skilled observers indicates that something is wrong somewhere. May it not happen that our knowledge of the chemical effects of the spectrum is not so exact as it might be? When some observers are convinced that a light modified with yellow paper and a green glass will give the maximum of luminosity and the minimum of chemical action, it is bewildering to be assured that spectrum analysis demonstrates the contrary. Further inquiry is necessary to clear up the subject." Exactly so; further inquiry is necessary to clear up the subject; but permit me to ask is there any reason why this inquiry should not be carried on in a friendly spirit—why it is necessary that there should be any personal feeling imported into this question, or any question that may come before the Society; is it not possible to discuss this matter without ranging ourselves into two hostile camps, the one taking ruby red as their ensign, the other orange? In my contribution to this matter I mean to be entirely practical. I have endeavoured to carry out the experiments, the results of which I shall lay before you, with a view of enabling you to pronounce upon certain fabrics, readily procurable, a verdict as to their suitability in all respects for the illumination of the photographer's work-room. I wish to steer entirely clear of all the subjects that excite so much feeling. Spectral analysis, coloured glasses, whether stained red, flashed, canary, green, are all out of my province; the materials I shall recommend are easily procurable, easily adaptable, and in my experience as a commercial dry-plate maker, answer the purpose most thoroughly.

But, first of all, great stress has been laid upon the hurtful effect of red light upon the eyes; but it seems to me as if the persons who urge this argument imagine that those who make, and those who use dry plates, did nothing but stare at their red light; but in all well-arranged works the eyes of the workers are not directed to the light, but to the work they have to do. The light, whatever it may be, should be arranged to illuminate the work, and shielded from the eyes. When you read a book or write a letter, your eyes are directed to your book or paper, not to the light, and the working of dry plates is, or ought to be, no exception to this rule.

As to the real cause of the evil, Mr. Bird, I think, hit the matter exactly, when he said:—"There can be no doubt that the sudden transition from dark to light is extremely trying to the eyes." If we consider for a moment the anatomy of the eye, we shall soon see how this is. The iris is the thin membranous coating, in the centre of which is seen the pupil of the eye. This pupil varies in size according to the action of the muscular fibres of the iris admitting more or less light into the interior of the eyeball, and the diameter of the pupil is so varied from about $\frac{1}{3}$ to $\frac{1}{10}$ of an inch. Now these muscular fibres, known as ciliary muscles, are brought into play by the amount of light presented to the eye; the stronger the light the more they contract the pupil, and the weaker the light the greater is the dilation of the pupil. But these muscles come into play comparatively slowly; if you go from bright sunlight into an obscured apartment, you can at first see but little; in a short space of time the muscles effect the dilation of the pupil, and you are enabled to see more or less perfectly; on the contrary, you go from an obscured chamber to brilliant sunlight, and you are pained and dazzled by the glare of light, but in a short time the ciliary muscles have succeeded in contracting the pupil of the eye, and, allowing no more light to enter than is requisite, vision becomes normal.

But here comes the moral of the story: the ciliary muscles act *slowly*, and *sudden* transitions from obscurity to bright light are hurtful; the sudden access of light strains the muscles in the effort to rapidly close the pupil; the remedy, of course, is to avoid sudden transitions; if necessary, to wear a veil, or enclose the eyes in protectors of gauze wire and coloured glass of the proper tint when leaving the dark room.

More than a year ago I read a paper before this Society upon "Photography in Relation to Colour." It will probably be within the recollection of those who heard that paper, and of those who afterwards read it as it appeared in the *Journal* of the Society, that of all the coloured bands I exhibited on the screen—which I have again placed before you—the yellow gave a greater sensation of brilliancy to the eye, while its photographic effect on a bromo-iodized gelatine plate was much less than any of the other colours. This fact, to my mind, showed the direction in which experiment should be made, for, other things being equal, there could be no doubt that the red light, then so common for laboratory illumination, was *per se* more trying to the eyes than a yellow light. The next step was to discover a material easily obtainable, which could be purchased commercially, either of the right tint, or capable of being made of the most suitable tint. After some search, I have found a fabric called bookbinder's cloth, no doubt procurable in many places. My samples were procured at Messrs. Berry and Roberts', 21, Bride Street, near Ludgate Circus. This fabric, in combination with a yellow paper, procurable wholesale of Messrs. Spalding and Hodge, Drury Lane, and retail at many dealers in photographic goods, has given in my hands a diaphanous screen which, while having quite sufficient illuminating power, is absolutely innocuous to the most sensitive plate.

To elucidate the question as to the best colour, I fitted up the lantern which I now place before you. You will observe that it is not unlike a magic lantern; it contains a paraffin lamp, and is opaque on three sides; it has a double bent chimney, to prevent the passage of white light and to afford ventilation. The fourth side carries two glasses, connected by a hinge of cloth, and so arranged that pieces of material to be tested can be readily placed between them. When this apparatus is used the lamp is lighted, the colour or combination to be tested placed between the glasses, and the sensitive plate exposed at a distance of eighteen inches from the screen, through which the light from the lamp must pass to reach the plate.

Before going further, permit me to call your attention to a chart of colours and combinations, with their symbols. The symbols have been written on pieces of clear glass, the size of the sensitive plates, in bold characters, with opaque varnish. It is evident that the portion of a sensitive plate underneath the characters will have been shielded by them from the light, whilst all the rest of the plate will have been exposed to its full power. Thus we shall find that the characters should come out clear, even though the rest of the plate has been fogged by the action of the coloured light.

THE CHART.

Colours and Combinations.	Symbols.
Ruby Fabric	R. F.
Orange ,, ...	O. F.
Yellow ,, ...	Y. F.
Ruby and Yellow Fabric	R. Y. F.
Orange and Yellow ,, ...	O. Y. F.
Ruby and Orange ,, ...	R. O. F.
Yellow Fabric, treated with Aurine ...	Au. Y. F.
White Paper ,, ,, ,, ...	Au. P.
The above two in combination ...	Au. Y. F. and Au. P.
Ditto, but with two sheets of the paper	Au. Y. F. and Au. P_2.

I made also many experiments with green fabrics of various shades, but I found a tremendous loss of light without the slightest corresponding advantage, and as I have no wish to overload my paper with useless material, I have thought it best to omit all reference to them, and only to bring before you those experiments which tend to practical usefulness.

I must now ask to have the light lowered, that I may pass before the paraffin lamp in my lantern the various colours and combinations that I have to bring before you.

I place between the glasses with which my lantern is furnished a single piece of the ruby fabric, and also exhibit the sensitive dry plate that has been exposed five minutes to the light passing through this ruby fabric, at a distance of eighteen inches from the coloured screen. Upon the sensitive plate was imposed a piece of clear glass bearing the letter "R," in thick opaque pigments; the portion of the plate under the letter has consequently been shielded from the light, whilst the rest of the plate has had the light full upon it for the five minutes. All the plates I shall show you have been fully developed for four minutes with a maximum dose of alkali. You will see that the R comes out clear on a decidedly dense ground, showing that one thickness of ruby lets through a great deal of actinic light. I now place a piece of the orange fabric in the lantern, and show you the result; you will notice that the orange has been even less efficient than the ruby.

* Read before the Photographic Society of Great Britain.

Now we pass on to the yellow fabric: you will notice how much brighter the light appears—that is, there is much greater illuminating power; yet the action upon the sensitive plate is actually *less* than with either the orange or ruby.

We will now put into the lantern combinations of these colours. We will take first, ruby and orange; the result is still a considerable veiling of the plate. Yellow and orange give less veil than ruby and orange. Ruby yellow give less veil than either of the other two, due no doubt to the protective power of the yellow.

It being quite clear that yellow gives more illumination, and has at at any rate as great a protective influence on the plate as either red or orauge, I decided upon adopting yellow as my standard colour, and my experiments were then directed to finding materials most suitable for a coloured screen, whether fabric or paper, or a combination of the two. I took some thin close texture white paper and coated it on both sides with a solution of aurine in varnish: dry plate negative varnish, 1 ounce, aurine, 1 dram. This had the effect of making the paper both tough and transparent. I also coated the yellow fabric with the same solution, and the results I will now place before you. The first is a thickness of aurined paper; this shows the veil considerably. I now put in a piece of the yellow fabric treated with aurine; the veil is still there in a very slight degree, much less than with the yellow fabric *minus* the aurine, the illuminating power being about the same. On placing the aurine paper and fabric together we get a screen that gives a good illumination and affects the plate very little; as a matter of practical experience, this screen is perfectly safe either for the making or the development of sensitive plates. I now place in the lantern one piece of yellow fabric and two pieces of aurined paper; this gives a fair amount of light, and its effect upon the sensitive plate is absolutely *nil*—no trace of the lettering can be made out. I consider this last combination absolutely perfect, either for daylight or artificial light, and should have no fear about working in a room lighted by a window of any size if covered by these materials.

As reference has been made to the *greens*, I tried them both as fabrics and coated glasses, and found them eminently unsatisfactory. Whenever a green can be got to have but little influence on the plate, it is always terribly low in illuminating power. I have brought a few of my experiments to show you, as the results were at any rate unexpected by me. I have here a dark green fabric, one thickness; it allows very few illuminating rays to pass, yet its action upon the plate is very great. The next is a light green—plenty of illumination, and the action upon the plate actually less than with the dark green. Dark green in combination with orange is better, but a lot of actinic light still passes. Dark green with yellow is a slight improvement on the former. Light green and orange is actually better than dark green and orange.

I think it is clear that of the three colours experimented upon—yellow, red, and orange—yellow has most illuminating power, combined with the least actinic effect upon the plate. I find for practical purposes one thickness of yellow fabric with one piece of paper treated with aurine to be absolutely perfect, to give a light comparatively pleasant to the eye, and to be perfectly innocuous to the most sensitive plate. For daylight I would advise one thickness of yellow fabric with two thicknesses of aurine paper to form the covering for a window of almost any size, with absolute security.

A most practical and convenient way of arranging these materials for the window of a photographic laboratory I find to be as follows:—Have an inner frame made to the window, let the lower third have another frame, which can be open to admit white light when necessary; cover this third with one thickness of yellow fabric and two thicknesses of aurine paper. Let the middle portion have one thickness of each; let the top portion have one thickness of fabric. Now, have a rolling blind, made of American cloth, fitted to the top of the frame. In taking the plates from the packet, placing in the dark slide, and commencing the development, use only the light of the lower third. When the development is well started the blind may be drawn up two-thirds of the way, and when the development is completed the blind may be drawn up entirely, and a flood of useful non-actinic light will pervade the apartment.

In some such way as this the working of dry plates will be found as easy and as pleasant as our old friend collodion, and by increasing the quantity of light gradually, the strain on the ciliary muscles of the eye will be reduced to a minimum, and we shall have fewer complaints of damage to the eyesight.

Correspondence.

THE REPRODUCTION OF DAGUERREOTYPES.

SIR,—In a recent issue of the PHOTOGRAPHIC NEWS, you adverted to it as a matter of fact, that, when faded silver prints are skilfully copied under the now attainable conditions, many of the details that by lapse of time or exposure had become altogether invisible, are satisfactorily reproduced.

I am led to enquire, whether the same success might be likely to attend the reproduction of any of the original plates of Daguerre and his *collaborateurs*, or whether within your knowledge any successful attempts to do this have been made?

It is now over forty years since, for the first time, I saw exhibited in a window in lower Holborn, one of the earliest Daguerreotypes ever brought into England. The picture was at that time an especial object of attraction and inspection, arising naturally from its seemingly miraculous minuteness of detail. Yet, unless looked at in a side-long manner, and from a particular stand-point, nothing could be seen but the spotless sheen of the silver plate. If I correctly remember, the view was of the Tuileries as it then stood.

Am I right in assuming that your remark, above referred to, might prove equally true as it respects these early productions of the camera?

That an unskilled attempt to copy such Daguerreotypes would be uniformly successful, I have some reason to doubt, for I happen to have in my possession more than one reproduction of a Daguerreotype portrait of a now celebrated personage—the original picture dating so far back as January, 1854.

In the best of these examples, a singular detail can be made out at a given spot—nothing less than a faint tracing of the crest of the family of which the individual was a member. This curious enblazoning would seem to have been etched into the epidermis with much skill and minute accuracy. Possibly it was effected in very early life, either with a pencil of caustic, the point of a lancet, or a needle. In any case, there is nothing to indicate the presence of colouring matter. Hence, no disfigurement would ensue; but only upon close inspection, that slightly enamelled appearance which a superficial cicatrice always presents.

As an unlooked-for agency of legal identification, the value of an authentic copy of that Daguerreotype, taken with all the accessories essential to a vivid reproduction of details, may be readily estimated. And the whole matter is one in regard to which photographers might be expected to entertain a lively interest.—With much respect, I am, sir,

W. MATHEWS.

THE FALMOUTH JUDGES.

DEAR SIR,—We notice that the judges still persist in saying our yacht studies are "elaborately retouched" in their report which appeared in last week's NEWS. After the explanation which was given last year, proving that they were not retouched, we consider that it has now become a malicious statement, and unless an apology or explanation is forthcoming, we shall not let the matter rest, as we consider our reputation at stake, and the accusation made most defamatory.—Yours truly,

G. WEST AND SON.

PACKING PLATES WHEN TRAVELLING.

SIR,—A correspondent recently asked in your columns for hints as to packing exposed plates when travelling. The plan I adopt, and find very satisfactory, is to obtain zinc boxes similar to those in which the makers pack the plates, the top fitting well down over the bottom. In each I place a good sized piece of washed Turkey red twill. As the plates are removed from the holder, I put

them on the twill, with a piece of clean paper between, and fold the twill over the top, and replace the cover. These boxes are quite light-tight, and two or three plates travel as safely as a boxful, if distributed in the portmanteau so as to have a good cushion of soft things, such as clothes, between them and the exterior.

I mentioned this method before in your paper, but repeat it, in case your correspondent may not have seen it.—Yours truly, GREENWOOD PIM.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 3rd inst., Mr. W. K. BURTON in the chair.

In a communication from the President of the Society of Amateur Photographers of New York, the following developing formula, emanating from Mr. H. J. Newton, was sent:—

Alkali Solution.

Granulated carbonate of soda	3 ounces
Carbonate of potash	3 „
Sulphite of soda	3 „
Water	1 quart

Dry pyro recommended, but if kept in solution, then formic acid is to be added, in the proportion of 1 minim to 4 grains of pyrogallol. Thus pyro 48 grains, formic acid 12 minims, water 12 ounces; 1 ounce of this pyro solution, ¼-ounce of alkali solution, and ¾-ounce of water, being the normal developer for an 8 by 5 plate.

Mr. A. L. HENDERSON could not see any advantage in the use of formic acid, which most likely would be inert; he thought the addition of glycerine quite as good.

Mr. W. COLES mentioned that in making up the formula it must be remembered that an American pint contains only sixteen fluid ounces.

Mr. W. E. DEBENHAM, after referring to an experience related some time ago by Mr. Cole—viz., that of a film completely dissolving when left during the night in the hyposulphite bath—passed round two commercial plates, presumably from the same batch, which had been left in separate hypo baths during the night. One image had disappeared, the other was uninjured. The bath in which the film dissolved was the older of the two, and somewhat weaker.

Mr. HENDERSON thought it due to an accumulation of ammonia through insufficient washing after development. He (Mr. Henderson) enquired if any great difference had been noticed in the speed of plates during the last few days. He found plates which four months ago registered 15 on the sensitometer, were as rapid as some recently made registering 22.

The CHAIRMAN said it was no doubt attributable to the high temperature. According to Abney, an increase in the temperature of a plate increases the speed, and *vice versa*.

Mr. HENDERSON had tried the experiment of thoroughly desiccating plates on a water oven; after the water became quite cold, the plates were exposed, and found to be quicker, and denser images were obtained. He also wished to know what is meant by the term hard gelatine—whether it is a gelatine that takes up a large or small quantity of water, dissolves at a high temperature or sets at a high temperature.

Mr. A. COWAN'S definition of a hard gelatine was as follows:—With given weights of any samples of gelatine dissolved in given quantities of water, the one which presents the strongest jelly when set is the hardest gelatine.

Mr. W. M. ASHMAN enquired if any one had given the ferridcyanide of potassium and hypo reducer a trial; he found it was all that could be desired, and perfectly under control. The proportions used were those published in the April number of the *American Photographic Times*, *i.e.*, a few drops of a five per cent. solution of red prussiate of potash added to sufficient hypo solution to cover the plate.

Mr. COLES preferred using stronger solutions; the strength he recommended in his recent lecture contained three grains of ferrid-cyanide per ounce.

A Member said he had succeeded very well by using the ferridcyanide first, then following with hypo; in fact, it was beyond all doubt the most perfect reducer known.

Mr. SUTTON passed round two prints from a Woodburytype block; one printed in the usual way, the other by the copper-plate system; in the latter case the centre was perfect, but the margins were not. Mr. Sutton considered he had been so far successful as to warrant him continuing his experiments.

A discussion then took place on the effect of pieces of cardboard and other papers used in packing dry plates. Several members gave their views on the subject, while some attributed the markings to pressure, others to atmospheric conditions, and some to impurities in the cardboard or paper employed.

The CHAIRMAN called attention to a useful table he had compiled (see "A B C of Modern Photography"), for calculating the stops of a Darlot's, or other series, according to the Great Britain Society's Standard.

Mr. J. BARKER had tried the plan of adding a small quantity of decomposed gelatine to an emulsion with a view to obtain density and speed, as suggested by Mr. Henderson and the Chairman at a recent meeting (see page 415). The suggestion was a valuable one, but care must be taken not to add too much, and the plates should be dried quickly.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The Exhibition of this Society, for 1884, will be held in the Gallery of the Royal Society of Painters in Water Colours, 5A, Pall Mall East, London, S.W., and will be inaugurated by a *conversazione*, open to members and their friends, at 8 p.m., on Saturday evening, the 4th of October. The Exhibition will remain open daily (Sundays excepted), from Monday, the 6th of October, until Thursday, the 13th of November. Admission (from 10 a.m. till dusk), one shilling. It will also be open every Monday, Wednesday, and Saturday evening. Admission (from 7 to 10 p.m.), sixpence. Members have free admission at any time, and will also be supplied with tickets to admit their friends. All packing cases must be sent (carriage paid), addressed to the "Photographic Society of Great Britain," care of Mr. James Bourlet, 17, Nassau Street, Middlesex Hospital, London. They may be sent *before*, but must arrive *not later* than, Thursday, September 25th, but no packing cases can be received at the Gallery. Pictures by hand will be received at the Gallery, 5A, Pall Mall East, on Thursday, September 25th, until 9 p.m. Photographic transparencies will be shown with the Society's optical lantern on Monday evenings during the Exhibition. Slides (which must not exceed 3¼ inches in height) must be sent in either on or before Thursday, September 25th (to come with other exhibits before the Judges of Awards), and will only be eligible for award when both the negatives and slides are the work of the exhibitor. Each exhibitor must send a letter of advice containing a description, as also a statement of process and any further detail, to be inserted in the Catalogue (and it is suggested that when the work shown is taken by a special process, prepared and made by the exhibitor, information as to particulars should be communicated), addressed to the "Hon. Secretary," Photographic Society of Great Britain, 5A, Pall Mall East, London, S.W. Each frame or picture may have the exhibitor's name and subject neatly inscribed, but no address or anything in the shape of an advertisement will be permitted. No pictures in Oxford frames, and no pictures previously exhibited in London, will be admitted. Photographs coloured by scientific or mechanical means will be admissible. Photographs coloured by hand will not be admitted. Negatives and transparencies will be admissible. Photographic apparatus and appliances may be sent for exhibition. No charge will be made to members of the Society for exhibiting their pictures; but to non-members, a charge of one shilling per square foot will be made for wall space—the minimum charge being five shillings—but no charge for wall space will be made to foreign exhibitors. It is proposed to lay on the table a catalogue containing the price of pictures to be disposed of; those who wish to avail themselves of this proposal will please state the price of their pictures in the letter of advice. Any further information respecting the Exhibition and *lantern slides* can be obtained from the Assistant-Secretary, Mr. Edwin Cocking, 57, Queen's Road, Peckham, S.E.

INSTANTANEOUS PICTURES.—An excellent series has been taken by Lieutenant David and Herr Seolik in Vienna; and the picture of the Corpus-Christi procession is of special interest, as the whole of the Court take part in this ceremony, the Emperor and the Imperial family accompanying the procession on foot from the Hofburg as far as the Church of St.

Stephen. The instantaneous picture secured by David and Scolik contains excellent portraits of the notable personages taking part in the procession.

DEATH OF MR. HENRY WATTS.—Chemical science has lost one whose name will always be remembered in connection with the literary history of the science, and although his magnificent Dictionary of Chemistry, now consisting of nine quarto volumes, may be regarded as his greatest work, his translation of Gmelin's Chemistry, his new edition of Ure's Dictionary of Arts, and his minor works, represeut no inconsiderable amount of labour. Mr. Watts held for many years the appointments of editor of the *Journal*, and Librarian to the Chemical Society, having been appointed to the former iu 1850, and to the latter in 1861. He was a Fellow of the Chemical Society, a Fellow of the Royal Society, and a Member of the Physical Society ; also an Honorary Member of the Pharmaceutical Society, and a Life Governor of University College. He was engaged at the time of his death in writing a new and abridged edition of the "Dictionary of Chemistry," and was also editing a re-edition of "Richardson and Watts's Technology," and the 13th edition of "Fownes's Manual of Chemistry," of which the second volume is left in manuscript. He died of syncope of the heart on the 30th ultimo.

GELATINO-CHLORIDE PAPER.—Dr. Just, of Vienna, has, during the past half year or so, manufactured sensitive gelatino-chloride paper according to the method given by Dr. Eder and Captain Pizzighelli. This paper is very convenient for making positive prints, and is exposed by a self-acting electrical arrangement. Good use is made of it at Vienna in preparing pictures of criminals. Stellmacher, the anarchist, when he recently attempted serious outrages, in Vienna, was not known by name, but in one night several hundred gelatino-chloride copies of his portrait were made, and by means of one of these portraits he was recognized at Dresden as a deserter. Dr. Just now manufactures the gelatino-chloride paper on a considerable scale.

DAGUERRE MONUMENT.—The Committee has rendered an account of its work to the subscribers. The subsriptions raised amount to fr. 8,119 95, but in the completion of the work much is due to the generosity of those engaged in its execution. M. A. Leclerc, for instance, architect of the Palais Nationaux de Versailles, who designed the monument, gives back his honarium as a subscription to the fund. A commemorative ceremony is fixed for the 27th inst., when M. Petersen, President of the Danish Photographic Society (among others) has signified his intention to be present. The unveiling of the statue took place in August last (see page 545 of our last volume).

PHOTOGRAPHIC CLUB.—At the meeting of this Club on July 16, the subject will be the adjourned discussion on "Focussing." Saturday out-door meeting at Hadley Wood. Train to Barnet, main line station, meeting afterwards at the "Old Salisbury Arms," High Barnet.

To Correspondents.

W. P.—Tolerably thick oil colour is best, only time must be allowed for it to dry. If this is inconvenient you may grind up water colour with albumen, and after having applied the colour you can render the material insoluble by the application of alcohol.

THE REV HENRY GEARY.—Your suggestion is an excellent one, and shall be attended to. 2. This matter is one which requires a few expertiments, but it shall be remembered. Thanks.

FLARE.—1. The stop is too near the lens; try the effect of removing it an eighth or a quarter of an inch further. 2. You may paint over the chipped part of the lens with black varnish, but this is not of so much importance as might be supposed.

CLAUD DOUGLAS.—As regards the shutter question you can read an article on page 435, and our advertisement columns will afford you the means of selecting suitable plates.

C. D. CUNNINGHAM.—1. Make a solution of one ounce of acetate of lead in eight ounces of warm water, and add two ounces of this solution to each gallon of the wash water. Half an hour should be sufficient if you adopt the lead method; but we do not recommend the use of lead unless in exceptional cases. 2. The best thing to use is Cowell's clearing solution (see the Formulary). 3. One ounce dissolved in a pint of water; but there is no objection to making it somewhat stronger than this.

CONSTANT READER.—1. It is difficult to give an approximate estimate of the cost, as so much depends on the extent to which upper part of the house will require alteration, and the condition of the roof; but between £50 and £100 may, perhaps, represent the probable expense. 2. You are more likely to lose than to economise by the use of second-hand building material.

R. S. BARRETT.—1. You put your muslin in the wrong place; it should be tied over the top of the teapot, not over the spout. By adopting this method you keep a reserve of filtered emulsion. 2. An ordinary chemical thermometer, with the scale either engraved on the stem, or enclosed in an interspace between the stem and a second tube. 3. Yes, to the boiling point. 4. It will make about four ounces. 5. Flood the plate and pour off the exeess, putting it back into the teapot through the strainer.

TONING.—The whole picture is fogged, excepting a rectangular patch, which includes the left arm. Probably this patch corresponds to a less sensitive place on the plate. Give less exposure.

PHOEBUS APOLLO.—(A) It has not come into general use, although the idea has been brought forward time after time, and films for negative work have been several times introduced into the market; and we cannot help thinking that the inconvenience of developing film negatives would be especially felt in a cross-country expedition. We would rather recommend you to obtain the thinnest glass, and either get it coated by a plate maker, or coat it yourself. (B) So have we, but except in a very few cases the film had been stripped from the plates, the original exposures having been made in the usual way. If you rub the glass plate with powdered French chalk, and dust off the excess before coating it with collodion, the film may easily be stripped off; and for this purpose all you have to do is to soak a sheet of plain gelatine in water until it is flaccid, and to squeegee it on the film. The edges must be clamped down with strips of wood while the film is drying. In the case of gelatino-bromide work, after having French-chalked the glass, coat it with plain collodion, and upon this pour the emulsion, after which the sheet of plain gelatine is squeegeed down as before. The sheet gelatine is the thick kind used by lithographers, and we have obtained it from Cornelissen, of Great Queen Street, Lincoln's Inn. (C) This we hardly think practicable, especially when far from the base of operation. (D) Well worth trying; and if you do not wish to enlarge the pictures very much, we think it would answer admirably. The address of the gentleman to whom you refer shall be sent to you by post.

H. and D.—We have not any doubt that the firm in question can supply what you require, and we have sent your letter on to them.

A. C. A.—1. A rather rapid exposure, and the use of a developer containiug a full proportion of bromide—perhaps twice the weight of the pyro. 2. Artificial light is to be preferred, as being less subject to variation than daylight, and you cannot do better than to use the "fabric" to which you refer. 3. For out-door work we may say that it has been entirely abandoned in favour of gelatine plates.

MUSICUS.—The pictures are very good indeed, and we are especially pleased with that containing only three figures. The remaining two would have been better if you had given a little more exposure, as there is hardly sufficient detail in the deeper shades. We have no hesitation in saying that they are fully equal, and perhaps superior, to the average of work shown at Pall Mall, and we hope that you will send us pictures occasionally in order that we may see how you get on.

The Photographic News Registry.

Employment Wanted.

General Assistant.—H., 115, Westmoreland-rd., Walworth.
Operator and Retoucher, from Paris and Italy.—N. E., *Photo. News* Office.
Recep. Room, Spot, &c.—A. B.—Orwell Cottage, London-rd., Twickenham.
Reception Room or Manageress.—M. E. C., 19, Oakley-cres., Chelsea.
Retoucher (pemanency).—Retoucher, 29, Brook-green-rd., Hammersmith.
Operator (Copyist) quick with children.—C. O., 25, Duke-st., Bloomsbury.
Operator or Manager, good all round.—W. W. 59, Queen's-sq., Bristol.
General Assistant at 30s.—A. B., *Photo. News* Office.
Improver and Assistant Operator.—E. D. G., *Photo. News* Office.
Retoucher & Reception-room.—A. D., 147, Victoria-pk-rd, S. Hackney.

Employment Offered.

Operator & Retoucher, dry-plate.—W. P., 5, Atkinson-place, Brixton.
Oper. (wet or dry) & Retoucher for country.—Apply, 70, Victoria-st., E.C.
Out-door Operator for groups, &c.—Hills and Saunders, Cambridge.
Neg. Retoucher, first-class.—T. William, 63, Darlington-st., W'hampton.
Operator & Retoucher (in-door).—Hills and Saunders, Cambridge.
Operator of ability.—Morgan & Kidd, Kew Foot-rd., Richmond.
Retoucher, Colourist, Spotter.—Photo. Co., 2, The Pavement, Clapham.
General Assistant (instantaneous work).—H. R. Sherborn, Newmarket.

The Photographic News.

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SUPPLEMENT TO "THE PHOTOGRAPHIC NEWS" 18TH JULY, 1884

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1350.—*July* 18, 1884.

CONTENTS.

REALISTIC PHOTOGRAPHS OF METALLIC OBJECTS.

ALTHOUGH many persons will prefer to have a plain print of such an object as a medal or a piece of plate, there are others who may think that a photograph showing a metallic lustre, and consequently very nearly resembling the original, is more satisfactory; and as it is very easy to make an excellent reproduction of a bright metallic object by transferring a transparent photograph to a metal or metallized surface, we propose to give some practical directions which will enable any person to make such reproductions.

The negatives for such pictures must be taken with uniformly dark backgrounds, as any light places would naturally show the metallic lustre of the backing, and the effect of the picture would consequently be completely spoiled. In short, the background should be uniformly black, and ought to be reproduced on the negative as clear glass, or something very near to it.

As far as our experience goes, the best reproductions of metallic objects are made by developing a carbon print directly upon a metal plate—copper, either gilt or silvered, being most convenient. The prepared copper plates, which are sold at a moderate price for use by the engraver, are extremely convenient, as they may be had in a great variety of stock sizes, while the prepared surface is smooth, and in a good condition for being gilded or silvered. It is not worth while for us to give directions for gilding and silvering, as such work is done at a very low price by the trade platers and gilders, who abound in Clerkenwell. The commercial "brown" tissue is a good colour for general work. As vigorous reproductions are generally required, it is well to use a rather weak bichromate bath for sensitizing—say about two per cent.; and in other respects the mode of working is precisely that recommended for making carbon transparencies on page 359 of the present volume, the metal plate being used instead of glass.

The direct method on metal renders it necessary to use a reversed negative, and when an ordinary negative is to be printed from it is necessary to transfer the carbon print from the support upon which it is developed, and this transfer may either be made upon a plate of metal, or upon a sheet of metallised paper. When the carbon print is to be transferred after development, it is best to develop it upon a flexible support, as directed upon page 332, and to transfer it to the metal plate or paper—gilt or silvered—in the manner directed for ivory on the one hand, and for canvas on the other hand.

As many of our readers are not so far practically acquainted with the process of carbon printing as to be in a position to make an occasional print with a tolerable certainty of success, it is satisfactory to know that excellent metallic pictures may be obtained by making a transparent picture upon glass, in such a way that the image shows unreversed when looked at through the glass, and backing up the transparency with a piece of gold or silver paper. Transparencies made by the gelatino-bromide process of Mr. Wellington (page 79) are excellent for this purpose, but collodion, gelatino-chloride, collodio-chloride, or, indeed, transparencies by any other process, may be used.

M. Geymet recommends a somewhat complex process of transfer with collodio-chloride, which we may summerise as follows:—A stout paper is coated with a moderately thick layer of plain gelatine, such a layer as would be produced by drawing the paper quickly over a solution of one part of gelatine in four of water, and this is coated with collodio-chloride, and printed as directed by Dr. Liesegang on page 772 of our volume for 1883. When toned and fixed, the print is placed in water at a temperature of about 80° Centigrade, and as soon as the edges of the collodion film become loosened by the dissolving of the gelatine, a clean glass plate, which is about half-an-inch smaller each way than the print, is laid on a table, and the collodion print is laid down smoothly upon it, and after all enclosed air has been expelled by stroking with the hand, the loosened edges of the film are turned over the edges of the glass. It will now, in all probability, be easy to strip the paper away, leaving the collodion on the glass plate; but if the gelatine should not be sufficiently softened for this, the back of the paper must be treated with a sponge saturated with hot water. When the paper has been removed, the same sponge serves to clear away all traces of gelatine from the film. A sheet of white paper is next taken and laid upon the film, care being taken to ensure contact all over by stroking it down with the hand or with a squeegee. The edges of the collodion film which were previously turned over the glass are turned back on the paper, and the paper, now carrying the film, is slowly stripped off the glass.

All is at last ready for transfer to the final support, whether this be gold paper, silver paper, or a metal plate; but this support should have been previously gelatined by having a solution of six parts of gelatine in one hundred parts of lukewarm water poured over it. The surface thus gelatinized is allowed to dry, but should be dipped in water immediately before the final transfer is made. The collodion film (now supported by the paper) is laid down on the final support, and the paper backing is next smoothed down with the hand so as to expel all air-bubbles, and the whole is allowed to dry. It is now easy to strip off the paper covering, and the picture should be varnished with an amber and chloroform varnish.

If it be desired to imitate the appearance of an old and

tarnished metal object—say antique bronze—a little green and yellow aniline colour should be added to the gelatinous mixture used in making the final transfer.

"SPARKLE" IN DRY PLATE NEGATIVES.

ONE of the very oldest complaints against gelatine dry plates is being revived. We used, when dry plates were first at all largely used, to hear on all sides complaints of their lack of power of giving density, contrast, or "sparkle." These complaints grew less frequent, and finally appeared to die out almost entirely. Certainly the work at exhibitions showed that a want of sparkle was at any rate not a *necessary* fault in a print from a dry plate. Now, again, after a year or two, during which there has scarcely been a complaint, we hear from all sides of a difficulty in gaining sufficient contrast in negatives.

What may be the cause of this we cannot say, but it is at any rate well to consider what can be done in the way of development to produce a negative of strong contrast.

There are some subjects in which the contrast of light and shade are so strongly marked that there is not much difficulty in getting strong negatives on almost any tolerable plates, but these subjects are possibly the exception. Under the class showing very strong contrasts, we can seldom class those, for example, which commonly come under the so-called "instantaneous" treatment which is now so popular. Subjects which are suitable for very rapid exposures have always very bright high-lights, but at the same time, even the shadows reflect much light, so that although there is a great deal of brightness, there is possibly not nearly so much range of brightness as there may be with a subject looking much darker, and requiring a very much longer exposure.

It is with the subjects of the kind mentioned, where the range of light is not great, that we require to use all our skill in the operation of development, so as to prevent the production of a thin useless negative.

We have in the case of most plates found that the greatest density could be got by the alkaline development, but there have been exceptions to this rule. We have occasionally had plates which would give considerably most density with a concentrated ferrous oxalate solution. We have found plates which gave green or red fog with alkaline development frequently give very dense images with ferrous oxalate.

It should be known that the strongest possible ferreus oxalate developer is made by shaking up dry protosulphate of iron in a saturated solution of neutral oxalate of potassium. The solution thus gained will, when there is added to each ounce of it about a quarter of an ounce of bromide of ammonium, make a very powerful developer, which will with some plates give a denser image than will any alkaline developer that we have tried. As a rule, however, we have found that the alkaline developer properly managed will give the best result. Here, at any rate, we have the means of introducing more variety than in the case of the iron developer.

In the alkaline developer we have three ingredients, the variation in the quantity of any one of which will almost as completely alter the nature of the developer as the alteration of either of the other two.

The three ingredients to which we refer are of course pyrogallol, ammonia, and ammonium or potassium bromide. It is generally conceded that the effect of increasing the first or the third of these—that is to say, either the pyro. or the soluble bromide—is to get a negative of greater sparkle. In considering, however, which of the two it is best to increase, it will be well to bear in mind that the two act quite differently. The pyrogallol is the active developer, and it is natural that to increase it causes increase of density. It might appear that we have nothing to do but to add in each case whatever quantity of pyro we find necessary, and we could put the requisite sparkle under any circumstances. This will not be found to be the case, however. It would appear that for every plate there is a certain strength of developer—as regards pyro—which gives a maximum of density, and that to increase pyro beyond this is simply to waste it. Exposing a number of plates for the same length of time, and using developers with constant quantities of ammonia and bromide, but varying quantities of pyro, we have found that increase of pyro meant increase of density up to a certain point; beyond that there was no effect at all produced except in some cases fog. With different plates the maximum useful amount of pyro appears to vary from one to four grains per ounce.

The action of the bromide in giving density is quite different from that of the pyro. The bromide has no active developing power, nor has it any power or even tendency in itself to produce density. On the contrary, it increases the time taken for density to be acquired. For example, if we expose the whole surface of two plates for similar lengths of time to the light of a candle, and develop them with developers the same in all respects except in that of the quantity of bromide contained, we will find that after a certain time has elapsed, the plate developed in the solution containing the less bromide will be the denser. Nevertheless, contradictory as it may appear, the developer containing the most bromide would give a denser negative than the other would.

The reason for the density-giving property of bromide is that it will keep the shadows of a negative clear, whilst the pyro and ammonia do their work for however long is necessary to get the required density in the high lights. Soluble bromide prevents the reduction of silver bromide which has not been affected by light. It has the effect of retarding the reduction of silver bromide which *has* been affected by light, but not of preventing it altogether—at any rate, not unless it (the soluble bromide) is in very large quantity.

There is thus no limit to the use of soluble bromide, as there is to the use of pyro; that is to say, there is no maximum to go beyond which will have no effect. The only question is how much bromide we may use without actually requiring a longer exposure to be given. Here we may say that no rule can be given. Some plates will be slowed by using a developer containing quarter as much bromide as there is ammonia. Others will not be slowed if there be a larger quantity of bromide than of ammonia. It depends entirely on the quality of the plate. As a rule, very rapid plates, and especially those made by the ammonia process, will stand large quantities of bromide without being perceptibly slowed. In any case it must be borne in mind that the thing which is of importance is the ratio of the bromide in the developer to the ammonia, not to the pyro. It is quite possible to have a very rapid developer with twice as much bromide of ammonia in it as there is pyro. All we have to do is to have in it several times as much ammonia as there is bromide. Again, we may have a developer as slow as we like with much less bromide in it than pyro, simply by keeping the quantity of the ammonia small.

The amount of sparkle obtainable varies greatly with the manner in which development is carried on. We have only to expose two similar plates similarly, and to develop one by allowing it to lie still in a dish of developer, whilst over the other we keep the solution in brisk motion. The latter will be astonishingly the brighter negative of the two. Again, those who have the patience, will find a marvellous amount of sparkle to be obtainable by the method of adding only a very little of the ammonia to the developer at first, and gradually adding more. We know some operators who will spend thus from half an-hour to an hour in developing a single negative.

RETOUCHING GELATINE NEGATIVES.

Many photographers varnish their dry-plate negatives, and then retouch them just as they were in the habit of retouching their collodion negatives, while others retouch directly upon the gelatine film; but it not unfrequently happens that the film is not in a condition to readily take the pencil markings, and in such a case the following mixture is useful:—

Ordinary oil of turpentine	...	100	parts
Common resin	...	2	,,
Venice turpentine... ...	...	4	,,

A little is applied to the film with the tip of the finger, and rubbed until dry.

Some years ago, Carroll recommended the use of a solution made by dissolving twelve grains of tannin, ten grains of gum, and one grain of salicylic acid in one ounce of water; this solution being distributed over the surface of the plate by means of a glass rod, and the excess drained off, after which the plate is allowed to dry.

An aqueous solution used in an analogous way is recommended by Re, of Jeletz, the fixed and washed plate being allowed to remain for a quarter of an hour in a solution of acetate of aluminium, after which it is allowed to drain and dry; and this mode of treatment can be repeated if the surface is not rendered sufficiently matt by the first operation. Negatives which have been properly treated with acetate of aluminium are as easy to retouch as gummed collodion negatives.

The acetate of aluminium solution for the above use can be readily prepared by dissolving one part alum in ten parts of hot water, and adding sufficient ammonia to throw down all the alumina—or sufficient ammonia to make the mixture smell of this reagent after a thorough stirring. The gelatinous precipitate of alumina is now collected on a cloth, and well washed; after which it is dissolved in a mixture of two parts of glacial acetic acid and one part of water. The acetic acid must be thoroughly saturated with alumina, and one can only be sure of this after it has remained for two or three days in contact with a portion of the precipitate. The solution of acetate of alumina should be filtered before use, and it must be kept in a well-stoppered bottle.

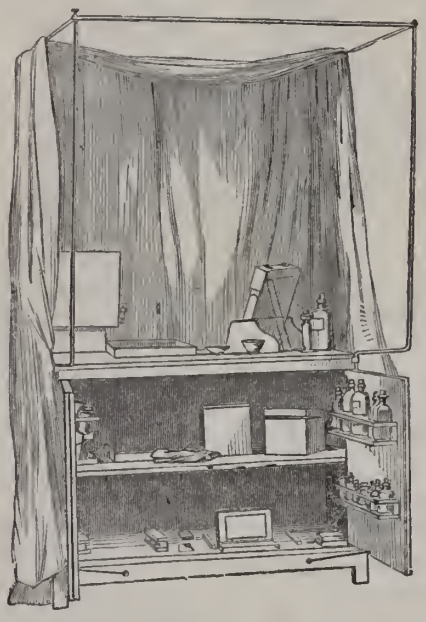
Practical Papers for Beginners.

HOW TO FIT UP A DARK-ROOM.

Photography depends upon the altering action of light upon the chemical preparations which are used in the making of the so-called sensitive surfaces, and in order to obtain an original photographic image (as distinguished from copies made by the numerous photographic printing methods) the well-known image of the *camera-obscura* is allowed to fall for a short time upon the sensitive plate. It must be noted that when the sensitive plate is removed from the camera no image is visible, and the action of light is only made apparent when the exposed plate is subjected to a process called development, and considering that the action of light on the properly-prepared sensitive surface is so energetic that an exposure of a fiftieth of a second to the subdued light of the camera-obscura is sufficient to determine the production of a picture, one might well suppose that the plate would have to be prepared, and the image developed, in absolute darkness. Fortunately, however, this is not so, as certain coloured lights exercise so little action upon the sensitive chemicals that the photographer can venture to use just sufficient of the coloured light to see what he is about. The dark-room of the photographer is not, then, an absolutely dark apartment, but a room lighted with coloured light, and as little of this as it is practicable to get along with, as no light is absolutely without action upon the plate.

The light admitted to the dark-room is filtered through a coloured medium, this medium being either placed over the window, or serving as a lamp screen if artificial light is used. But what colour is this medium to be? Yellow, orange, and red are the colours having the least photographic action, and either one of them may be employed.

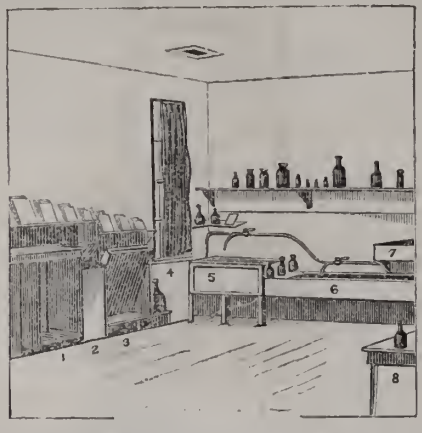
Before saying more about the dressing of the window of the dark-room, or the screening of the lamp, let the beginner determine what kind of a room he will have. In the old days of photography, when it was usual to "develop" a picture immediately after exposure in the camera, almost everyone possessed a tent or portable dark-room which could be taken out anywhere; but now-a-days, when tents are used at all, they are employed at home, and are erected in the corner of a study, in a library, or in a spare room. We do not recommend a tent for general work, but one who does not wish to prepare sensitive surfaces or plates for himself may manage to develop his pictures fairly well in such a tent as is represented below. No explanation is required, except to say that the black cloth covering must



hang over the rails in front, so as to entirely enclose the worker, who is enabled to see by the light passing through a small window made of coloured fabric. It is seldom, however, that the beginner cannot find some apartment which may be converted into a dark-room, either altogether, or as occasion may require. Even when the beginner knows that he will be the sole tenant of his new dark-room, he will seldom have sufficient determination of purpose to begin by taking all the white glass from the window of his future dark-room, and replacing it by two thicknesses of the stained red glass recommended by Captain Abney, as this would be equivalent to nailing his colours very firmly indeed to the photographic mast; but he will construct a light framework which will fit accurately outside or inside the frame of the window, and cover this with two or three thicknesses of the non-actinic fabrics which are, sold commercially; one thickness of the so-called ruby fabric and one thickness of the yellow or golden fabric as ordinarily sold, makes an excellent combination. Some shades of orange paper are also good. The frame should be so made as to be readily removed and readily replaced; this being a very essential precaution if exclusive possession of the room is not to be had. A few shelves for bottles, some kind of a portable sink—the outlet tube of which may lead into a pail—a large can of water, some square porcelain dishes, and a light-tight box or so for holding packages of plates that have been opened, completes the list of essential arrangements. The incipient

photographer who can obtain sufficient control of a bath-room to be allowed to fit up a few shelves and a small cupboard, is especially fortunate, as he has water supply—perhaps hot as well as cold—and a magnificent sink. In spite of the excellent qualities of a bath as a sink, it is convenient to so place the lid of an old box across the bath so as to afford a steady support for the photographic vessels; but a hole should be made in the box-lid, so as to allow the waste fluids to run freely out into the bath.

The subjoined cut represents a more completely fitted photographic dark-room or laboratory than the beginner will ordinarily possess, but it is easy to see how one may



arrange something which may serve very well as a substitute. Of conrse it is all very well for the advanced unprofessional photographer to fit up a comfortable laboratory, as represented above, with washing trough (5), sink (6), water supply, ventilator, and other convenient arrangements; but the beginner must generally make shift with something far less elaborate.

If it is intended to do all work by daylight, the arrangement described for screening the window with the coloured fabric or paper will serve very well; but as daylight is very variable in its intensity, and the photographer should have the means of regulating the amount of light admitted through the coloured window, it is advisable to provide a black blind mounted on an ordinary roller, this blind serving to more or less completely cover the coloured window, according to the intensity of the light. If the window is glazed with the "stained red" glass, the blind roller should be fixed in the usual position; but if, on the other hand, the wooden frame covered with the coloured fabric is made use of, the blind roller should be fixed on the top of the movable frame. Some prefer a black curtain running with rings on a rod, as shown in our sketch. At any rate, it is essential to have a means of partially shading the window when daylight is used, as during dull weather the

whole window may only give barely light enough to work by, whilst if the sun shines brightly it may be essential to stop out nine-tenths of the window area in order to ensure against such an excess of coloured light as would act injuriously upon the sensitive plates.

Owing to the constant variation of daylight, many prefer to completely block out the light of the window, and to work altogether by lamp or gas-light; and it is often better to purchase a dark-room lamp, whether for gas or for oil, than to make one. The foregoing drawing shows an excellent form constructed to burn paraffin oil.

As Mr. J. B. B. Wellington points out on page 407, a very convenient dark-room lantern may be extemporised by wrapping a piece of golden fabric round an ordinary tricycle lamp, the fabric being kept in position by means of an elastic band or string.

Before using the dark-room, it is necessary to very carefully cover any chinks which may admit white light, this being commonly done by tacking on strips of American cloth or other opaque material; and it is often essential to fasten such strips all round the door.

Our next Practical Paper will be on—"Preparing for Work with the New Camera."

FRENCH CORRESPONDENCE.

Progress of Photography in its Application to Ceramic Decoration.

This week's letter is dated from Limoges, where I am about to give my annual course of photo-ceramic lectures at the National School of Decorative Art.

It is becoming more necessary than ever to say a few words upon the use of photography applied to the decoration of porcelain.

Limoges is an important centre for porcelain manufacture, bringing in annually a considerable amount of business: and the art of decoration plays a part worthy of attention in the completion of the productions.

To decorate the ware, implies necessarily not only the use of various methods of painting or special printing, but also, in a country the good taste of which is incontestable, competent artistic knowledge. Unfortunately, talented artists are difficult to induce to make sacrifices, and the manufacturers, whose working principle is to make a profit, find it impossible to pay a good artist well, and have recourse to a decorator of second-rate talent. It therefore comes to pass that the work of the present day has depreciated in value and taste.

It is of no use thinking of introducing figures, copies of pictures, or landscapes, for they might appear as shapeless drawings badly coloured. One is therefore reduced to conventional flowers and ornament as being good of their kind, and superior to an ill-executed figure or landscape.

In the absence of good artists, however, by employing photography there is still a method open for the reproduction of pictures, figures, &c.

I have called the attention of the Limoges manufacturers to this important consideration, and moreover in the conferences have demonstrated the practical method of setting to work.

First of all recourse must be had to a means of transferring the original photograph, as in the Ives, Meisenbach, &c., processes. The negative being transformed into a typographic block, prints in blue ink are taken off to trace on tinted or striated paper. These papers are used instead of the lithographic stone in former demand. Each monochrome executed in black with pen, pencil, or brush, has only to be reproduced its actual size in the camera on plates capable of giving intense blacks and transparent whites. From these plates the images are printed on zinc coated with bitumen, and set to bite in acid, so that prints may be taken from them as from lithographic stone. To prepare the zinc plate, choose one thin and very smooth, coat with bitumen for receiving the

negative impression, and develop with spirits of turpentine. A bitumen image is therefore formed on the plate. It is next placed in a solution of copper, so that the plate is covered with that metal wherever the bitumen is absent. After washing with water and drying, it is finally immersed in benzine to remove all traces of the bitumen. It is then made to bite for forty seconds in a two per cent. aqueous solution of nitric acid. This gives a lightly grained surface, and the plate is ready for printing purposes.

Each print is made with fatty varnish in which is suspended the enamel colour. By employing this process, the services of a clever artist may be dispensed with. It is only necessary to have a man of taste in choosing the subjects to obtain charming effects. These details are taken from one of the most practical processes indicated by me at Limoges. It is to be wished that the industry of ceramic decoration will seriously take up photography, as it is capable of rendering such good service. Leon Vidal.

CARBON PRINTING.

Lesson V.

Carbon Tissue and Transfer Papers.

The foundation of both carbon tissue is gelatine, and, in order to simplify the manufacture of the tissue, the first step is to make a jelly as follows:—

Nelson's transparent sheet gelatine ...	10 parts
White sugar	4 ,,
Water	25 ,,

Soak the gelatine in the water until soft, then gradually raise the temperature until the gelatine is dissolved, and add the sugar; now submit to the action of a churn for half-an-hour, and allow to set. When set, scald off the frothy top with hot water, then turn the jelly out, and cut off the bottom portion so as to get rid of any grit that may have settled down, and the jelly is ready.

For a tissue giving a good photographic purple brown, take—

Vegetable black	72 grains
Alizarine lake	60 ,,
Indigo	13 ,,

Grind these materials with about four ounces of melted jelly, using a muller and slab or a cone paint mill, and add to six pounds of the above mentioned plain jelly, and mix well. In order to avoid the labour of grinding, one may make use of the ready-ground water colours sold in tubes, but in this case it is difficult to ensure making one's tissue of definite composition. In ordinary cases one may estimate the tube colours to contain about half their weight of colour.

For a black tissue—

Jelly	2 pounds
Paris black pigment ...	... 50 grains

For red or Bartolozzi tissue—

Jelly	2 pounds
Venetian red	3 ounces
Indian ink	8 grains

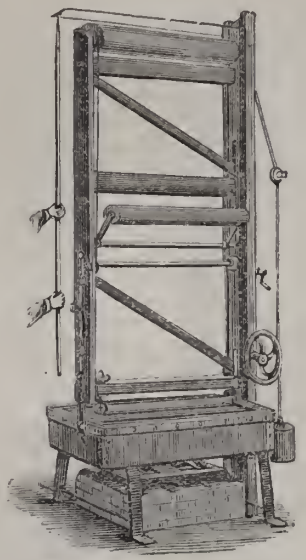
For transparencies—

Jelly	2 pounds
Indian ink	... 200 grains

The tissue compound being made, it is strained through muslin into a dish, this standing in a larger dish containing hot water, and if this outer dish is of metal, a spirit-lamp or Bunsen-burner will be convenient to keep the water at a constant heat, and so prevent the tissue compound from setting.

The paper that it is desired to coat is now rolled up tightly face outwards, and the roll is laid upon the surface of the tissue compound, the loose end being gradually raised, when the surface of the paper will gather up a thin and even coat of pigmented gelatine. The length of paper being coated, it is placed over a stick and allowed to dry.

For commercial purposes the paper is coated by means of a machine, an illustration of the late Mr. Spencer's being here given.



At the bottom will be seen a water-bath arrangement for keeping the composition warm, and after a long strip or band of paper has been placed over the system of rollers, and the ends made fast to each other with sealing-wax, the whole is lowered down till it comes in contact with the composition, and the band of paper is made to pass over the gelatinous mixture at the rate of about a foot in two seconds. When the whole of the band has been coated, it is divided at the join and hung up to dry. The roller which is shown as hinged on projecting arms, serves to keep the band of paper tense, and the rod shown as being held at the left hand side of the machine, is for taking off the wet tissue; the horizontal extension-piece being placed under the band at the top.

For making double transfer paper, take of—

Hard gelatine	1 pound
Fine sulphate of baryta or permanent white	8 ounces
Water	5 pints

Mix thoroughly, and stir in a solution of 50 grains of chrome alum in four ounces of water.

For a single transfer paper take—

Hard gelatine	1 pound
Water	5 pints

Churn for a quarter of an hour, then add 300 grains of chrome alum dissolved in a pint of water; this will make the liquid somewhat thick and ropy, but sufficient acetic acid must be added to restore it to its original fluidity.

Paper is coated with either of these two compounds in the same way as with the tissue compound.

THE SPECTROSCOPE AND ITS RELATION TO PHOTOGRAPHY.

by C. Ray Woods.

XII.—The Application of Photography to Spectroscopy.

The aid which photography has given to the work of the spectroscopist pure and simple has been great; but to give it in detail would be beyond the limits of a series of articles written for photographers. In considering this subject, therefore, it is advisable to consider, mainly, the methods which the spectroscopist has adopted, more than

the results he has arrived at. The subject may conveniently be divided into two parts—1st. Solar and chemical work, which are too closely connected to be treated as separate subjects; and 2nd. Stellar spectroscopy.

When the chemist has recourse to the spectroscope in a purely analytical examination of some compound, or mixture of compounds, there is no real necessity for photography to be brought in at all. The elements are recognized by their most important lines which the chemist is in the habit of observing, and even when some unlooked-for line is noticed, the eye observation and measurement are relied on as affording the quickest and readiest means of determining its cause. In advanced research, however, when it is desired to notice the molecular nature of the substance under examination, photography has proved a valuable auxiliary, more especially in recording what takes place in parts of the spectrum that the eye is not able to take cognizance of. And when, again, the source of light is too weak for eye observations to be definitely made, photography, by its power of accumulating impressions, as it were, has done a great service; for instance, in examining faint flames, or in resolving the comparatively faint light given by the electric spark in highly rarified medias. In such cases, however, the simple method of procedure is to obtain as high a dispersion, either by prisms, or by the diffraction grating, as may be found necessary, and to direct the spectroscope to the source of light, and insert a plate in the camera attached to the instrument.

But when examining the light from the sun, it is found that so innumerable are the number of lines in the spectrum, and so greatly does that number increase when a higher power is brought to bear upon them, that eye observations are too tedious, and many lines are found to be overlooked. One has only to refer to the celebrated map produced by Dr. C. W. Vogel, of the Potsdam Observatory, and to compare it with the celebrated map produced by Angström by eye observations only, to see how great an advance the former is upon the latter. A few figures bearing on the subject may not be without interest. In a portion of the blue near G, a region accessible to both the eye and the plate, but more so to the latter, Angstrom measured 94 lines, Rutherford photographed 275 lines, and Lockyer photographed 412. In regions which are only just within the ken of the eye, the reader need scarcely be told that the superiority of the photographic record is still more marked. In solar work, when the behaviour of some particular line or lines is in any way remarkable—and this is frequently the case—it becomes absolutely necessary to ascertain what element the line or lines in question belong to. It is for such work that careful and elaborate mapping of the lines of all the metallic and non-metallic substances known here is most desirable, and for this work the photographic plate is most in request, except in recording the lines in such portions of the spectrum, such as the green and yellow, that lend themselves most readily for eye observation. At present we have chiefly to rely on the work of Kirchoff, Angström, and Thalèn, for the coincidences of terrestrial spectra with dark solar lines. These workers did not make use of photography, and it is worthy of note that the first-named lost the use of one of his eyes in compiling the laborious piece of work that established the existence of

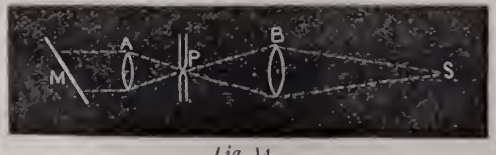


Fig. 14.

many terrestrial substances in the sun. Some time since, Lockyer commenced mapping the metallic spectra on an extended scale, but only a very small portion of it has as yet been published. The foregoing diagram will explain his method of working.

The sun's rays are thrown by means of the mirror M, driven by clockwork, on to a lens A, which forms an image of the sun between the carbon poles, P, of the electric arc. A second lens, B, throws the image of the sun, and also of the carbon points, on to the slit, S, of the spectroscope. By this means the light of the sun, and also that of the metal placed on the poles, come from the same point before entering the instrument. The slit of the spectroscope has an arrangement for opening only one-half of the slit at a time, so that first the arc and then the sun, or *vice-versâ*, are impressed on the plate, one appearing above the other. A little consideration of the conditions of working will show that the coincidences of metallic and solar lines cannot fail to be very precise.

The best map until very recently of the ultra-violet portion of the spectrum, that we have, is that produced by Cornu, and Professor Hartley has been assiduously mapping the metallic lines in that region. Professor Rowland has lately, by means of his beautiful gratings, produced a magnificent map of the solar spectrum by means of photography, and by drawing a scale of wave-lengths on the original negatives, the whole can be reproduced by photo-mechanical methods without the intermediation of the draughtsman. The mechanical arrangement adopted by Professor Rowland in using his curved gratings, in which the focus is obtained automatically by means of trammels, is shown in the following sketch.

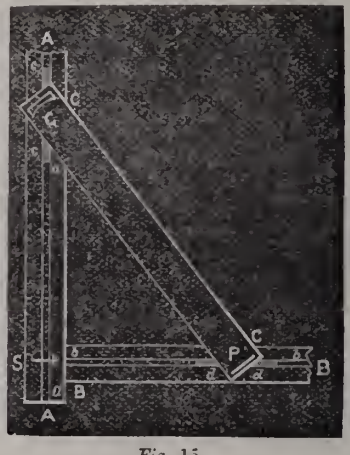


Fig. 15.

A A is board with a groove, *a a*, along its centre. At the point where the slit S is fixed, another board, B B, is joined on at right angles. This board has a similar groove, *b b*, the position of the slit being opposite the centre of the groove. C C is a board carrying the grating G, and the ground-glass or photographic plate P, the distance of the two apart being exactly equal to the radius of curvature of the speculum on which the grating is ruled. At points exactly beneath the centre of grating and plate, the board C C is fixed by means of a single screw on to pieces of wood, *c c*, and *d d*, that slide along the grooves. In whatever position the board C C is placed, the plate is always in focus. Of course it is necessary to keep out extraneous light by covering the whole arrangement, or using long bellows or boxes open at both ends. Photographers will probably find this the most convenient arrangement, but there is another method shown diagramatically on the following page.

From the centre, C, a circle is drawn with a radius equal to half the radius of curvature of the speculum. The grating G, the slit S, and the plate P, may be placed at any part of this circle, and the plate will always be in focus for whatever part of the spectrum may be at that place; of course the slit must always be directed towards the grating, and

the plate be tangential to the circle. It can be stated from the writer's personal knowledge that this method has been adopted by at least one eminent spectroscopist in America, and another in England.

Fig. 16.

In photographing the spectra of stars, planets, nebulæ, &c., the difficulty to be overcome is the feebleness of the light when it is spread out in the form of a band. Dr. Huggins, the principal worker in this direction, uses the reflecting form of telescope, and focusses the image of the object upon the slit of spectroscope, and throughout the long time of exposure has to carefully keep it there, it being practically an impossibility to get the clock of the telescope so accurately adjusted as to follow the motion of a star with unfailing accuracy. The spectroscope has lenses of quartz and a prism of Iceland spar, both these substances being highly transparent to the ultra violet rays. The minute, but sharp and beautiful spectra which Dr. Huggins has been able to produce of the light from some of the stars and nebulæ, and of those occasional celestial visitors, the comets, testify to the usefulness of photography, and more especially modern rapid dry plates, in this delicate research. On the other side of the Atlantic, too, the late Dr. Draper has done useful work in this direction. The evidence, too, which Dr. Draper obtained of the probability of the existance of oxygen in the sun is yet another valuable outcome of photo-spectroscopic research.

Nor must mention be omitted of the work of Captain Abney in examining that invisible portion of the spectrum which lies beyond the red, and his work in conjunction with Colonel Festing in investigating the absorption spectra of organic compounds, and establishing evidence of the existence of hydrocarbons between the earth and the sun. Without photography, such research would have been impossible. The utility of photo-spectroscopy in eclipse work, and its discoveries in relation to the corona, has too recently been before the readers of the NEWS to need more than a passing remark in this place.

This article, and the preceding ones, profess to be little more than a sketch, and there have necessarily been many omissions, but, it is trusted, not important ones. It has afforded the writer considerable pleasure to write them, and in concluding them, he trusts that he has at least made good use of his space, and that his readers will kindly pass over any shortcomings there may have been in them, apart from actual inaccuracies, which at least he hopes he has avoided.

A Dictionary of Photography.

AMADINE, an old name for *dextrine.*

AMMONIA AND AMMONIUM SALTS.—Ammonia is, at ordinary temperatures, a gaseous body, and contains hydrogen and nitrogen in the proportions indicated by the formula NH_3. It is possessed of the well-known pungent smell and very powerful alkaline properties. At a temperature of about —40° C. it becomes liquid, at —75° it solidifies. The substance sold in the shops as liquid ammonia is a saturated solution of the gas in water, and the commercial preparation has usually a specific gravity of about ·881, and contains something over one-third of its weight of ammonia. Ammonia is very largely used in the arts, and also by the photographer, one of its most important uses being in compounding the alkaline developer; and it is also used by many for fuming albumenized paper before exposing in the printing-frame (*see* ALBUMENIZED PAPER, PRINTING ON). Ammonia enters into combination with acids, forming salts which are supposed to contain a quasi-metal, NH_4, this group appearing to act in combination like a metal. Several of these salts of ammonium are of considerable importance to the photographer. The **Bromide of Ammonium**, $NH_4Br=98$, is very soluble in water, and is appreciably soluble in alcohol or ether; its main photographic use is to form bromide of silver by double decomposition with the nitrate. The **Carbonate of Ammonium** is a salt which occurs commercially in semi-transparent lumps having a strong ammoniacal odour, and when exposed to air for some time a large portion is lost by evaporation, and a compound remains which may be regarded as a bicarbonate. Carbonate of ammonium, when used for photographic purposes—as, for example in compounding the alkaline developer—should consist of translucent lumps without any friable incrustation on the surface. The **Chloride of Ammonium**, $NH_4Cl=53·5$, commonly known as **Sal-Ammoniac**, is a salt which has been known from very ancient times, and has many commercial uses. The photographer makes use of it in salting paper, and in other cases when chloride of silver is to be produced by reaction with the nitrate. The **Hydrosulphate of Ammoninm** and the **Sulphide of Ammonium** may be obtained in solution by passing a stream of sulphuretted hydrogen gas into an aqueous solution of ammonia; the former being formed if the ammonia is in excess, and the latter when the sulpheretted hydrogen is in excess. The solution of hydrosulphate or sulphide thus obtained is used occasionally in certain intensifying processes, as, for example, that of Eder or Toth. Its action depends on its power of converting certain metals of the first group into black sulphides. The **Iodide of Ammonium** is a somewhat unstable salt, and is almost always met with discoloured from the presence of free iodine; but if kept *absolutely dry* and in the dark, it may be preserved without change. Being much more soluble in alcohol and ether than other iodides, it has been extensively used for iodizing collodion. The **Sulphocyanate of Ammonium** is a deliquescent salt which is manufactured from the ammoniacal liquor of the gas works, and it has been proposed to use it as a fixing agent; but, up to the present, it has been very little employed by the photographer.

AMMONIO CITRATE OF IRON. *See* IRON.

AMMONIO NITRATE OF SILVER. *See* SILVER.

AMORPHOUS (à negative prefix, and *μορφή* shape)—A term applied to any modification of a substance which exhibits no crystalline structure; such forms of carbon as lamp-black or charcoal being termed amorphous to distinguish them from the crystalline varieties, like diamond or plumbago.

AMPHITYPE (*ἀμφί*, on both sides).—A process of Sir John Herschell, in which light produces either a positive or negative. Paper is first prepared with a solution either of ferro-tartrate or ferro-citrate of mercury, and then with a solution of ammonio-tartrate or ammonio-citrate of iron, the latter solution being in excess. On exposure in the camera, a negative results. This gradually fades in the dark, but may be restored as a black positive by immersing it in a solution of nitrate of mercury, and ironing it with a very hot iron.

ANGULAR APERTURE.—The angular aperture of a lens is the angle which its diameter subtends at its focus; or, in the case of a lens stopped down, the angle which the opening in the diaphragm subtends.

ANHYDRIDE (à negative prefix, and *ὕδωρ* water).—A term applied to those oxides which form acids by unity with water.

ANHYDROUS (derived as above), free from water. Anhydrides are often spoken of as anhydrous acids.

ANILINE PROCESS.—A process of printing originated by Willis in 1864. Paper is sensitized with:—

Saturated sol. of bichromate of potassium	4 ounces
Sulphuric acid	1½ drachms

Exposure is made under a positive if a positive is required, and development is effected by placing blotting-paper saturated with aniline at the bottom of a dish, and the exposed paper is supported over it. Simple washing serves for fixation. Sometimes it is convenient to dilute the aniline with fifteen times its volume of benzole. Exposure is about one-third that required for a silver print.

ANTHOTYPE.—A process of printing which depends on the sensitiveness of the colouring matters of certain flowers, the coloured juices being extracted by pressure.

ANTHRAKOTYPE.—(*ἀνθραξ*, charcoal).—A method of copy-

ing tracings, &c., due to Pizzighelli. The process gives—like the aniline printing process—a positive picture from a positive; it depends on the same principle as the (so-called) dusting process. Paper is coated with gelatine, sensitized in a chromate bath, dried, and exposed behind the drawing to be copied, immersed in water a short time, is blotted off, and dusted with any fine powdered pigment, washed again, and rubbed with a soft sponge for removing the superfluous colour. In this way pictures in any colour can be produced—plumbago, ultramarine blue, green, sepia, cinnabar, gold, silver, bronze, &c.

Notes.

In reproducing some of the photographs taken by the late Mr. Baden Pritchard during his trip to the Sahara, we are doubtless meeting the views of those who would like to have some memorial of his last holiday-trip.

The first of the series, which forms our supplement this week, is a view of Algiers. Can we do better than quote some remarks from Mr. Pritchard's own account of his journey?—"Algiers is never seen to better advantage than when you first sight its white-terraced houses, tier above tier, bordering the sunny bay, the blue water flecked here and there with snowy sails. The Grand Mosque, with its huge white dome, is a wonderful landmark, while the magnificent stone quays—all seen at their best as you come round the bend of the railway—and the fine old-fashioned harbour, compose a superb picture."

No profession requires more tact and talking power than photography. As a rule, people don't know what they want, and have to be gently pilotted into what the photographer knows is best for them. But when somebody who has made up his mind as to what he does want presents himself, the task of the photographer is a hard one, for in ninety-nine cases out of a hundred, the sitter, without knowing it, has made up his mind to be ridiculous. Some time ago a clergyman waited upon one of our best known photographers, and insisted upon being taken in a devotional attitude—"not exactly praying, you know, but with the eyes uplifted to heaven." He had his wish gratified, but speedily came back with the proofs, observing that the photographer had utterly failed in making him look pious, for on showing the picture to an old college chum, the latter irreverently remarked that he "looked like a dying duck in a thunderstorm." He asked for a re-sitting, adding that he had come to the conclusion that in the matter of portraits there was nothing so safe as the common-place, with which sentiment the photographer cordially agreed.

To write home on a post-card is an advantage which was not enjoyed by the tourist of a few years ago, and at the present time anyone who writes from Heidelberg on a post-card can at the same time send an excellent photograph of the castle.

The collotype occupies about one-fourth of the space on the card, and contrasts very favourably with the old-fashioned steel-engraved note-paper heading of English holiday resorts.

Let us suppose a series of twenty or thirty views of London, each to be had on a post card. How many thousands would go to the uttermost ends of the Postal Union with such a remark as "St. Paul's, as seen when fog, dust, and smoke were absent": or we can imagine one of Mr. Cobb's instantaneous pictures of active street traffic in London being sent into the wilds of Texas endorsed, "This is the dangerous river I have just crossed.' If the cards were to be had, some visitors would send hundreds away to their friends.

Post-cards can be had in sheets. The printing could be done by collotype, or the method by which Messrs. Sprague and Co. print our supplements; and the cards when cut up might be sold at a penny with a good margin of profit. Will Mr. Cobb or Mr. York take the hint?

We wish we could name the Heidelberg photographer whose idea is such an excellent one, but there is no imprint on the card.

The very latest photographic "fad" in Paris is for the fashionable swain to have the portrait of his lady-love photographed on his thumb-nail! At least, so says the *Graphic*.

A suggestion made by Captain Abney, to be found in our last number, will prove valuable to the tourist who takes a camera along dusty Continental roads. The inside of the dark back is to be rubbed over with glycerine—a mere trace, of course, as all excess must be wiped off with a dry rag.

The glycerine forms a veritable trap for that dust which will penetrate even the very best cabinet work; and the dust adheres to the sticky surface instead of making pinholes on the plate. Of course, the slides must be carefully wiped before fresh plates are put in.

The amateur photographer looked sad and troubled. It was his first attempt, and he had been trying for an hour and a-half to weigh out pyrogallic acid on the kitchen scales with a quarter of a pound weight and small shot from the gas chandelier!

A barge race on the Thames is hardly suggestive of much romance, and yet Messrs. West and Sons, of Gosport, have made a series of excellent pictures of the "event" which took place on the third instant. The photographs of the *Gibbons*, the *Electric*, the *Louisa*, and the *Bessie* show that the heavy river craft may be really elegant and even graceful when rigged out in full sail. The last-mentioned picture pleases us most, as the white foam thrown up by the bows, the tense sails, and the long trail behind, all give an excellent idea of motion; while the almost microscopic

detail is really surprising. A small whitish streak attracts us—no doubt a trifling defect in the negative—but by using a magnifier we find it is merely the name and address of the sail-maker—"Gill and Sons, Dorchester."

It is to be regretted that the Cornwall Polytechnic Society should so persistently state Messrs. West's pictures to be "elaborately retouched"; and after the correspondence which took place in our columns last year there is no excuse for a repetition of such a statement in the judges' revised report as just printed. We have noticed no evidence of retouching in any one of Messrs. West's yacht pictures which we have seen, and we have seen nearly all.

What Mr. Rockwood says:—"My ideal of the best photographer is one who is most the Chesterfield in his manners. A Daniel Huntington in his art, a Bacon in his range of information, a small edition of Shakespeare in his knowledge of human nature, and is possessed of the genial humour of Dickens." "But why should a photographer be all this?" asked the interviewer. "Because," answered Mr. Rockwood, "as sure as the chameleon reflects the hue of its surroundings, so is the sitter to reflect in some measure the mood of the photographer who sits him."

An Electrical Exhibition will be opened in Philadelphia during September.

The second period of excitement regarding electric lighting may now be considered over, and each week we find that an Electrical Company has quietly passed out of existence.

When electric light was talked of and exhibited twenty-five years ago, comparatively little capital was invested in it—perhaps not ten thousand pounds altogether; but the case is different at present, as individuals have now risked and lost as much as this.

Still much good has been done. New points have been elucidated, and knowledge has been gained. It might have been better, however, to have invested the money in technical schools: but the public would not have put down the money for educational purposes, so the greed of wealth has advanced science.

The student may now purchase electrical apparatus cheaply enough. Indeed, at the odds and ends market which takes place near the Caledonian Road of a Friday afternoon, we have bought incandescent lamps, carbons, the armature of a dynamo, and resistance coils for as many sixpences as they cost pounds a few months ago. "If you will not give seven pounds, what will you offer?" said the proprietor of a lumber shop in the Waterloo Road to us this week, as he pointed to a dynamo of the Siemens type; "there is five pounds worth of copper-wire on it." Here is a fall!

Lord Rayleigh, in speaking of his colour-mixing apparatus the other day, remarked that he himself was exceptionally insensitive to red, and Professor Guthrie claimed for himself exceptional sensitiveness to the blue rays. It is very easy to now understand the difference of opinion as to the relative brightness of the lights recently shown at the meeting of the Photographic Society.

The colour-mixing apparatus referred to above is an optical arrangement for combining different parts of the spectrum.

A spherical water lens, an old camera box, and a strip of sensitive paper, are the three elements which build up Professor McLeod's sunshine recorder. The record is a well-defined black line.

Colonel Hoe, the printers' engineer, says that printing will ultimately give way to photography. He thinks that through a negative of one side of the journal it will be possible to flash a ray of electric light a hundred times a minute, which ray may be made to fall on a web of paper passing under the negative.

We should like to know whether Colonel Hoe reads the NEWS, and more especially if he ever read the remarks contained in an editorial on page 2 of our volume for last year.

A correspondent who is good enough to call our attention to the very poisonous nature of the fumes from the pyrotechnic mixture recommended by Mr. Frewing in our issue of last week, failed to notice that Mr. Frewing himself says a word of caution. But in dealing with arsenical vapours one can hardly be too careful, so those who use Mr. Frewing's lamp for photographic purposes should especially note the last paragraph of his paper (page 440).

Papers of photographic interest at the British Association are rare now-a-days; but we may note this year the British Association at Montreal will almost join hands with the American Association at Philadelphia. The former meets on August 27, while the latter has fixed its opening day for September 4th, so as to be able to receive such of the Britishers as can be present.

Mr. S. P. Langley's article in the American *Journal of Science* on "Experimental Determination of Wave-lengths in the Invisible Prismatic Spectrum" has been translated into the *Annales de Chimie* for June, and is pronounced by the *Athenæum* to be of great importance in connection with the article published by M. H. Becquerel in the *Annales de Chimie*, and Captain Abney's Map of the solar spectrum.

Mr. Francis Galton's efforts to secure tabulated records of family history by means of his "Record of Family Faculties," in which all that one knows of one's ancestors is to be set down, have, we understand, been very successful. He now possesses reliable data concerning the history of a hundred-and-fifty families, and five thousand persons. This material

abounds with curious and interesting facts, but of course requires to be sifted and arranged, a task which Mr. Galton will doubtless enter upon with much zest. Mr. Galton's second proposition, the "Life History Album," which, besides the details of your life, is to contain a photograph of you taken every five years, is much more difficult of attainment, and from its very nature can only be dealt with by a philosopher upon whom Mr. Galton's mantle may fall.

THE USES OF A BACKGROUND.

BY A. H. WALL.

There is a stale old story about Sir Joshua Reynolds which I've no doubt you have often heard. The great P. R. A. was asked why he did not engage inferior artists to paint his backgrounds. Sir Joshua replied, "The man who could paint my backgrounds could paint my pictures."

These words gave expression to a very simple commonplace truth, which every artist recognizes; but for the young in art here are a few briefly expressed reasons, more fully illustrative of Sir Joshua's meaning, intended to demonstrate, for those who are students of art photography, that a background is really a most important and powerful agent in the production of a good picture.

1. The background, by conveying an impression of space behind the head and figure, gives that very important and effective quality, relief.

2. By a set of creative contrasts, cleverly realised, it gives to the high lights increased brilliancy, and to the deepest shadows greater intensity.

3. By excluding *destructive* contrasts, it increases the refinement, delicacy, and subtlety of the half-tones in light, gives new value to the intermediate uniting tints, and transparency to the deepest shadows and reflected light.

4. By enabling the artist to increase greatly the scale of gradations between the highest lights and the strongest shadows, the modelling, or rounding out, of the heads and figures becomes more powerful or vigorous.

5. It enables him to give the outlines that mellow softness which conveys the idea of surfaces retiring from the eye, and thereby gradually becoming invisible, instead of an appearance of flat sections with abrupt terminations. By blending with itself some of these boundary lines, and giving others prominence, it introduces that variety which makes the general effect rich and pleasingly picturesque, while it at the same time emphasises the expression of both space and relief.

6. By the background's aid we can soften, render less conspicuous, or altogether conceal any portions of a figure, face, or drapery which are unavoidably inelegant or ugly, or, for other reasons, undesirably conspicuous; and, on the other hand, by its assistance we may increase the prominence of parts which are elegant and beautiful, or most powerful in conveying the ideas we desire to impress upon the spectator's mind.

These are but a few of the many important uses an artist finds for his background, and as they concern chiefly light and shade, they of course apply as forcibly to photographs as to pictures painted in colour. A background of one uniform tint, upon which a flat even light falls, is, in reality, no background, for it does not serve the purposes of a background. It is a flat wall with nothing on it to convey ideas of space or atmosphere, and in a painting or a photograph gives, consequently, a flat cut-out-and-inserted effect (which is altogether inartistic) to the object placed before it. I know that our ordinary photographer is commonly apt to consider light and shade effects solely with reference to his living models. But this is a mistake. An enclosed space behind the model, with its own real light and shade, its own depths of space and reflected lights, will give effects strikingly superior to those obtained by a flat screen placed a foot or two behind a sitter. A space running back for some little distance, dimly lighted and containing objects which will indicate various degrees of retirement, enable you to vary your light and shade behind the sitter, or to vary the sitter's position relative to them, until you see upon the ground glass that the very best effect attainable has been achieved. You would then photograph real space, not pretended space, and you could choose from a wide diversity of effects, created by admitting or excluding subordinate lights and shadows, that which would be most desirable, instead of having either a never-changing blank flatness of wall surface upon which the only shadow thrown must be that of the sitter, or effects of chiaroscuro which are alike for all sitters, and suppress the exercise of everything like taste, judgment, sentiment, or artistic feeling. Then the individuality of the artist could find expression in his work in a much higher degree, and to a much wider extent than it now does, and one good photographer's work would not look so much like that of all the others. The mind that conceived could then take precedence over the lens that created this or that image, and the suggestions embodied in my six short paragraphs would be of solid, practical value and importance. All the possibilities I have briefly enumerated are impossibilities with the ordinary painted screen background, which never really looks like anything but a painted screen. A background chamber so ingeniously constructed and arranged that one could readily vary its effects, with a plan to enable us to re-arrange and alter its lighting, always subordinating its lights and darks to those on the model, and covering so much space lengthways that the artist could move his models to the right or left with the above ends in view, is, I think, the background most to be desired.

For those operators who have not the requisite space at their disposal, the best substitute would be, perhaps, a graduated background, moving from right to left, panoramic fashion, upon upright rollers, and painted in gradations of simple light and shade, so that the smallest turn of this or that roller would give a change of lights and darks, and successive turns changes more strongly marked. With such a background delicate features in a portrait need not be rendered feeble and flat by too strong contrast with a dark, vigorous background, while features too staringly prominent need not have greater prominence awarded them by contrast with the soft and delicate gradations of light and shadow in the background.

Examine a fine collection of portraits by our best artists, and you will find each has a background peculiarly its own. Study them, bearing these few hints in mind, and I fancy you will quickly see the reason why.

The author of "The Art of Portrait Painting" (published by Windsor and Newton) says:—"Nothing so materially aids the effect of a picture as a judiciously-disposed background"; "and nothing," he says, "so readily destroys the best-intentioned production as the injudicious treatment of a background, or the careless neglect of its advantages." He adds: "The background must support the figure in such a manner that the latter may not have the appearance of having been cut out and pasted on a dark or light surface, an effect continually seen in the works of the fathers of the art—and in photographs. No painter, with any love for his art, could be satisfied with painting his figures in one pose, or employing one stereotyped background on all occasions. Were it so, it would not be difficult to copy almost every circumstance from some good picture. In the course of practice every painter is continually experimenting with his backgrounds."

Sir Joshua Reynolds points out, as indicating the masterly powers of Teniers, that he surpassed all others

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in knowing what proportions of outline to leave sharp and distinct, and what to lose in the shadow of his backgrounds.

Many of the French portrait painters begin with the backgrounds, and paint their heads up to them, often with wonderful richness and variety of effects. In this way the photographer might make studies of his background effects preparatory to posing and lighting the sitter. It would be capital practice in an artistic direction.

Breadth is a quality in a picture the importance of which is constantly enforced in the R.A. lectures and in all the works of our best painters. This also cannot be ensured without the background's assistance; but as this is a subject deserving more detailed treatment, I reserve it for a separate article.

DR. DRAPER'S RESEARCHES ON ASTRONOMICAL SPECTRUM-PHOTOGRAPHY.

BY DAVID P. TODD.

AT the time of his death, in November, 1882, Dr. Henry Draper had, for a number of years, been largely occupied with very tedious and costly investigations connected with the photography of the spectra of the heavenly bodies, his unusual adaptedness for the prosecution of which research conducted him to results of the highest importance. With true scientific spirit, Mrs. Draper has generously placed at the disposal of Professor Young and Professor Pickering all the data necessary for the proper publication of the work; and, in a monograph of about forty pages, the former gives an introduction to Dr. Draper's researches, together with a description of the apparatus with which they were made, extracts from the original note-books, and a list of the photographic plates in Mrs. Draper's possession; while the latter, who took a number of these plates to the Observatory of Harvard College in the spring of 1883, presents the results of his measurements, accompanied by a discussion of the plates.

Dr. Draper's attention appears to have been first turned towards spectrum-photography in 1869 and 1870, although his photographic work in other fields previously to this time had been singularly successful. His first work in science, conducted while a medical student in New York, and which related to the function of the spleen, was illustrated with micro-photographs of great excellence; and very soon after taking his degree, while on a visit to Parsonstown, Ireland, he became so thoroughly impressed with the photographic possibilities of the great reflecting-telescope of the Earl of Rosse, that, soon after his return home, he began the construction of a metallic speculum of fifteen inches diameter, which was soon replaced by a number of silver-on-glass mirrors of about the same size, the details of the construction and mounting of which formed the subject of one of the Smithsonian contributions to knowledge, published in 1864. Seven years later, he had completed with his own hands the entire construction and mounting of a twenty-eight inch silvered-glass mirror, with which he obtained, in May, 1872, his first photographs of the spectrum of *a* Lyrae by merely inserting a quartz prism in the path of the rays, just inside the focus of the small mirror, and employing neither slit nor lenses. Three months afterwards, the same method secured for him plates showing four lines in the spectrum of the same star. For two or three years following, Dr. Draper's time was, for the most part, occupied with other lines of work, connected with investigations of the solar spectrum, and the superintendence of the photographic preparations for the transit of Venus of 1874. He returned to the subject of stellar spectra in 1876, obtaining a number of photographs with a fine twelve-inch refractor by Alvan Clark and Sons. This instrument, now the lesser telescope of the Lick Observatory, was replaced in Dr. Draper's establishment, in 1880, by an eleven-inch Clark refractor, which was provided with a correcting-lens fitted to be placed in front of the object-glass to adapt it to photographic work. This instrument was mounted on the same set of axes with the twenty-eight inch Cassegrain mirror, as were also a finder of five inches aperture, and one of two inches,—all of which are well shown in the picture of the telescopes in the Hastings Observatory, vol. i. of *Science*, p. 31.

Dr. Draper's eminent successes in celestial photography were due in large degree to his own skill and discoveries in the manipulation of the sensitized plates. Until 1879, wet collodion plates were used in all his experiments; but after that time he employed exclusively the dry plates made by Wratten and Wainwright, to the admirable performance of which, in the hands of Dr. Huggins, his attention was called by that distinguished astronomical physicist, on a visit of Dr. Draper to England in 1879.

Professor Young directs attention to the fact that the investigations of stellar spectra were by no means carried on continuously, but only during Dr. Draper's summer residence at his country-place, and in the intervals of other, to him, even more absorbingly interesting researches and urgent business occupations. The difficulties proved to be well-nigh insurmountable; for at first the limitations imposed upon the time of exposure by the use of the wet process made it almost impossible to get impressions of sufficient strength—a difficulty which vanished on the introduction of the modern dry-plate processes: and another difficulty, increasing with the length of the exposure, was that of securing a sufficiently accurate movement of the driving-clock. No less than seven such clocks were constructed before he succeeded in getting a perfect one. Its regulator was a pair of heavy conical pendulums, so hung that their revolutions were sensibly isochronous through quite a range of inclination. The gearing and driving-screw were constructed, for the most part, by Dr. Draper himself, with the utmost care and accuracy; and Professor Young says that, in its ultimate perfected condition, the driving-clock was as good as any in existence, being able to keep a star upon the slit for an hour at a time, when near the meridian and not disturbed by changes of refraction.

And besides, the effect of changes of temperature upon the spectroscopic portion of his apparatus, and the difficulty of securing nights on which the atmosphere would not cut off the actinic rays to an unusual degree, not to mention the fact that the observatory was more than two miles distant from his residence—these and many other conditions hindered the progress of the work. Spectrographic operations are, as Professor Young well says, much more sensitive to atmospheric conditions than are visual observations.

As regards the spectroscopic apparatus, a great many forms were employed, the first of which has already been mentioned. Later, direct vision prisms were used in the same way, and spectroscopes made up of such prisms, some with a slit, some without, and some with a cylindrical lens to give necessary width to the spectrum. In the definitive arrangement of the apparatus, with which all the plates measured by Professor Pickering were made, a re-modelled form of Browning's star-spectroscope formed the basis of the instrument; the telescope and collimator each having a focal length of six inches, and an aperture of 0·75 of an inch. The eye-piece and micrometer being removed, a block of hard wood was fitted on in such a way as to carry the photographic plate (a small piece of glass about an inch square); and a small positive eye-piece was mounted on the block, so that the yellow and red portions of the spectrum, projected beyond the sensitive plate into the field of view, could be examined at pleasure. It was thus possible to be sure that the driving-clock was running properly, and that all the adjustments remained correct. The whole apparatus weighed less than five pounds, and could be screwed on the eye-end of whichever telescope it was desirable to use it with. The development of the plates was usually by ferrous oxalate, though the alkaline development and pyrogallic acid were both used on some occasions. The pictures were about half an inch long, and one-sixteenth of an inch in width, extending from a point between the Fraunhofer lines *F* and *G* to a point near *M*.

Professor Pickering divides his work on these plates into three parts: first, the determination of the relative positions of the lines in the various spectra in terms of any convenient unit of length; second, from the known spectra of the moon and Jupiter, a determination of the relation of these measures to wave-lengths; third, a reduction of the measures of the stellar spectra to wave-lengths, and a discussion of the results. The stars whose spectra have been measured are *a* Aquilae, *a* Lyrae, *a* Aurigae, *a* Boötis, and *a* Scorpii. The spectrum of the first of these stars is remarkable for containing, in addition to the intense broad hydrogen-bands which characterize the spectrum of *a* Lyrae and similar stars, a multitude of very fine lines, which are easily seen between *G* and *H* in several of the plates, but are too delicate to be satisfactorily measured. Dr. Draper considered these fine lines very important as showing that Altair should be regarded as a sort of intermediate link between *a* Lyrae and Sirius on the one side, and Capella and the sun on the other.

On the plates of the spectra of *a* Aurigae and *a* Boötis, not only do the lines appear to coincide in position with those of the sun, but their relative intensity seems to be nearly the same. Of the twelve lines seen in at least seven of the nine spectra of the moon and Jupiter, every one is contained in the spectra of both *a* Aurigae and *a* Boötis. Of the fifteen lines which are so faint as to be contained in but one or two of the spectra of the moon or Jupiter, only four are contained in the spectrum of *a* Boötis, and but one in that of *a* Aurigae. There is therefore no room for doubt of the correctness of Professor Pickering's conclusion that the evidence afforded by these photographs is very strong indication of the sameness of their constitution with that of our sun.

Professor Pickering's method of deriving his results from these plates is worthy of note here, as indicating the great degree of confidence to which they are entitled. To secure entire independence in the results, the measures were completed before the reductions were begun. The lines in each plate were measured without comparison with any map, and no search was made for lines which appeared to be wanting. When two similar spectra were photographed side by side, care was taken to cover one when measuring the other. Under these circumstances, the agreement in the measures of certain plates is strong evidence of the identity of the spectra.

Appended to this monograph are three of the papers of Dr. Draper, reprinted from the *American Journal of Science*: 1°, On photographing the spectra of the stars and planets (December, 1879); 2°, On photographs of the spectrum of the nebula in Orion (May, 1882); and, 3°, Note on photographs of the spectrum of comet *b* 1881 (August, 1881). The first of these papers gives, in brief form, a very lucid statement of the conditions of the problem of celestial spectrum-photography, as well as the obstacles which he had, up to that time, overcome in solving it.—*Science*.

Patent Intelligence.

Applications for Letters Patent.

9,899. LORENTZ ALBERT GROTH, K.G.V., Civil Engineer and Managing Director of the Universal Inventors' and Patentees' Financial Company, Limited, 10, Finshury Pavement, London, E.C., for "A new or improved photograph and pictnre-stand."—A communication to him from ahroad by Theodor Münch, Vienna, Austria.—(Complete Specification.)—Dated 8th Jnly, 1884.

9,914. ERNEST DANIEL ADCOCK, St. Giles Street, Norwich, Photographer, for "An improved vignetting apparatus for photographic printing-frames."—Dated 8th Jnly, 1884.

10,029. JAMES BROWN, 49, Southampton Street, Pentonville, Cahinet Maker, and FRANK BISHOP, of the firm of Marion and Co., 22, Soho Square, Photographic Stationers and Pnhlishers, both in Middlesex, for "An improvement in plate-changing apparatus for photographic cameras."—Dated 10th July, 1884.

Patents Sealed.

1,898. CHARLES SANDS and JOHN JAMES HUNTER, both of 20, Cranbourn Street, Leicester Square, in the county of Middlesex, Manufacturers of Photographic Apparatus, for "Improvements in the construction of photographic cameras."—Dated 22nd January, 1884.

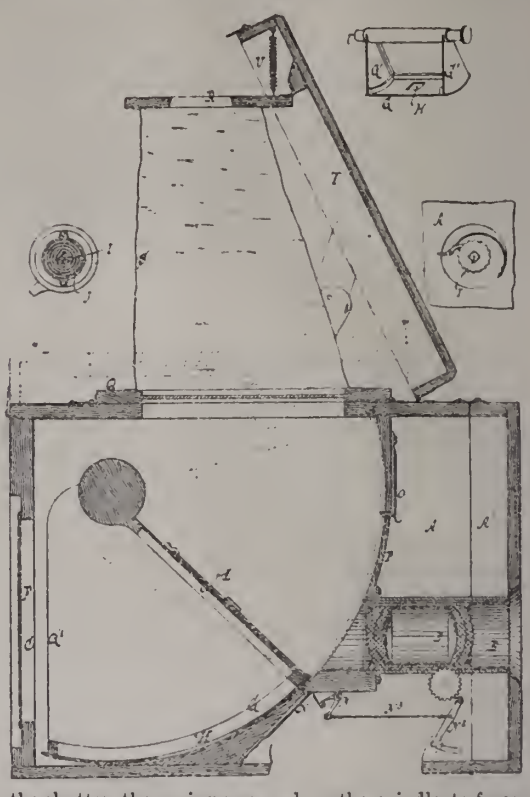
3,026. JOHN and ALFRED GEORGE HOPKINS, of Amwell Cottage, Hoddesdon, in the county of Herts, Photographers, for "A new apparatns for the exposing of photographic sensitive plates in cameras."—Dated 9th February, 1884.

Patents Granted in America.

301,400. CALVIN RAY SMITH, New York, N. Y. "Photographic Camera." Filed, April 17th, 1884. (No model.)

Claim.—1. The combination, substantially as hereinbefore described, of the camera-box having a lens-opening and plate-opening in opposite sides, and a focussing-glass in the top, the swinging shutter adjacent to the lens-opening having an exposure-opening to register therewith, and the mirror arranged on the shutter to reflect the image in the focus of the lens on the focussing-glass when the shutter is moved to an opened position.

2. The combination, substantially as hereinbefore described, of the camera-box having a lens-opening and a plate-opening in opposite sides and a focussing-glass in the top, the swinging shutter adjacent to the lens-opening having an exposure-opening to register therewith, the mirror arranged on the shutter to reflect the image in the focus of the lens on the focussing-glass when the shutter is moved to an open position, the axial spindle



of the shutter, the spring arranged on the spiudle to force the shutter from an opened to a closed position, and the catch arranged to engage the shutter in its opened position.

TAKING BABY'S PICTURE.

WITH the photographer, as with the mesmerist, it is necessary that the subject should he passive. A baby is never passive. He or she, as the case may he, is always either acutely belligerent or intensely responsive. Another serious obstacle in the way of the photographer's success with babies is the unaccountable propensity many of them exhibit for sleep at all times and in all places, which, coupled with their capacity for growing alarmingly red in the face whenever awakened, makes the operator's life anything but a bed of roses. The greatest man on earth—the hero of a hundred hattles, who can look grim death in the face without winking—is like wax in the hands of the photographer. He submits meekly to snch indignities as having his chin rudely elevated to suit the reqnirements of art, and allowing his neck to he sharply twisted until his jugular protests in vain; but the puniest habe in arms will permit no such liherties. Strategy is the only power it recognises.

The worst of all habies to photograph is the fat baby. Set the boneless mass of misshapen flesh in the operating chair, he leans forward on his stomach, lolls out his tongue, and, while leering at the carpet, two streams of saliva course down the sides of his chin, making him a sight to behold. A little worse, and he would break the camera. All efforts to brace him up into an attitude of semi-respectability proviug fntile, he is finally "taken" in a recliuing position, or is giveu up as a had job.

Then comes the animated baby—an India-rubber institution, augmented by the elasticity of conutless steel springs. Nothing comes nearer perpetual motiou than the animated baby. Lay her on her back, and she kicks; roll her over, and she kicks and squirms with untiring perseverance; stand her on her head, and she will go up through the roof if she is not held down. If the photographer is sharp enough to catch her hetween jumps or kicks or sqnirms, he will get a very decent uegative; otherwise it will be all legs and arms, and flannel petticoats, and things.

When tired nature asserts itself, and the squalling baby is perforce in a state of momentary repose, the photographer can, if he is quick enough, secure a very passable representation; but as nature, in this instance, fails, oftentimes, to get tired for some weeks at a stretch, the country is not flooded with such representations. It is unnecessary to add that the squalling baby is invariably a girl.

Some photographers make a speciality of "taking" babies, but as all babies, up to a certain age, are quite similar in appearance, it is presumed that a photograph of this class reduces the strain on his system by making use of an adjustable dummy for the foundation of his picture, incorporating with the finishing touches a few objective points of the supposed original.—*The Chicago News.*

AMATEUR PHOTOGRAPHY

BY SIGMA SMITH.

THE ease with which photographs can be taken by the modern dry plate process leads the tyro to roam about always on the look-out for whomsoever he may focus.

When I first took up the rôle of an amateur photographer, I made myself a veritable terror to the neighbourhood, and those who knew of the new bent of my mind went by my domicile in fear and trembling and with an anxious aspect, just, for all the world, as if they were actually in a studio—for a portion of my paraphernalia was an instantaneous shutter, by the aid of which I was able to secure rapid views. Sunday was my great day, and just as the people began to file past on their way from church, out came my camera, and, concealed amongst the lilac bushes in my front garden, I was wont to lay in wait, like a tiger ready for its spring—and almost as much dreaded by my friends—and, so soon as a notable group came within range, click went my trigger, and lo! the picture only needed to be developed and otherwise prepared. Thus I was in the habit of producing pictures in which highly respectable and decorous old gentlemen would be shown standing on one leg, with the other lifted in the air, as if hopping; another would be portrayed in the form of an animated letter X, as he happened to be taken just as he was making a stride; another would be shown in the act of taking off his hat with a sweep, but appearing in the photograph as though committing a violent assault, with the said head-gear, upon the lady who was in reality being gracefully saluted; others would be blowing their noses and looking ridiculous; others who happened to be walking past at a more brisk pace than usual, might be presented sans legs at all—each looking like a head and trunk with some diaphanous cloudy-looking support that gave a very phantasmal general aspect to the object; one gentleman—who wore a white hat, and who stooped in his gait—always gave the impression, in the resulting photo, that he was carrying his nose by the shortest cut to the ground; and this gentleman, in particular, who was of a meek, retiring disposition, became a livid object of terrified apprehension as he neared the spot, and hastened onward in the greatest trepidation in order to avoid being, as it were, lampooned—for I took great care that any striking picture was duly circulated among the group of friends.

This was of course all very wrong and unchristian, but, fortunately for my victims, many of these attempts were failures—either from one cause or another—but sufficient survived the various vicissitudes of the perfunctory treatment of the novice to "get my name up." People got at last to carefully put up their umbrellas as they passed, and all I could focus was an apprehensive nose; and those who had been in the habit for years past of grouping themselves at the corner where the cross roads divide—just opposite my house—became afraid to do so, but went a little way onward, so as to be covered from the baleful glance of my searching lens—much to my chagrin.

It was curious to see those who were in the secret, and did not mind being photographed, so long as they could be made to appear dignified, pass by my hiding place. They drew themselves up to their full height, and scrupulously turned towards the possible camera their best side face, and generally placed themselves in the most romantic and interesting attitudes; but all in vain, for so fell was the spirit that then actuated the amateur photographer, that, so soon as he saw them all ready, he turned the angle aside, and sought for other and more noticeable subjects.

Passing traps and bicyclists were aimed at by the score, and sometimes only the hind wheel was secured on the plate; or sometimes a cart appeared to be but a square mass of fog, or the horse's legs did not show, or it had two heads.

In the earlier stages of the craze, for such it was, my family fell into the groove I thus prepared for them with the greatest enthusiasm, and were ready to be photographed whenever and in whatever combination I, the pater, chose to fix upon; but even they—long-suffering as families are to the fads of their progenitors—became at last so thoroughly sick of the constant posing and focussing, that at last it was only by dint of unlimited bribes—in the shape of sweets and toffified presents—that even the youngest of the clan could be induced to submit his rubicund countenance and podgy form to the influence of the camera; the bulldog, too, became so familiar with the whole business, that she actually sniffed when her master assumed a wheedling air, with the well-known camera and black velvet in his grasp. The times that that bulldog has been focussed would use up the computations of a multiplication table, and unhappily, as a rule, the result has been dire failure—as that very estimable quadruped generally winks, or becomes conscious of the possibility of eats and starts away, thus spoiling an otherwise unblemished photo.

In nothing so much as photography does wisdom come from experience, and the tyro soon learns to moderate his aspirations, and to confine his efforts to more practicable subjects, until he gains more skill in the manipulation of his lens and his chemicals.

To the tourist the camera is a most interesting adjunct, as, by its aid he can secure an ever-living view of each place of interest, and when he returns home, instead of seeking to laboriously describe in words the sights he has seen, all he need do is to proceed into the darkness of his cellar, or dark-room, and develop his negatives, and then scatter his prints broadcast among enquiring friends.

During a tricycle tour in England, and in Normandy and Brittany last year, the present writer took something like fifty or sixty views of different places and scenes of interest. Most of these turned out fairly well—although he was then but in the first months of his novitiate—and, therefore, it can readily be understood that the art is not difficult of acquirement. One of these views was an impromptu picture of his *compagnon du voyage*, fast asleep in bed at nine o'clock in the morning, when the breakfast-bell was ringing, and the amateur photographer had been out for a couple of hours in the early sunshine, and had been luxuriously bathing in the sea in St. Aubyn's Bay, Jersey. This picture is an everlasting memento of a lazy man, and is duly labelled as such.

The whole of the apparatus, stand and six plates included, only weighs 5 lbs. 8 ozs., so that there is no difficulty in transport.—*Time.*

Correspondence.

MR. C. PURDON CLARKE'S PHOTOGRAPHS.

SIR,—In your last number you remark on the absence of the name of the producer of the prints illustrating my paper on Indian Street Architecture in the Journal of the Society of Arts of the 4th inst.

These photo-lithographs were prepared by Mr. W. Griggs, of Peckham, who had a difficult task in producing such a large number of prints (from rather poor negatives) on a very short notice. The transparencies were prepared by Professor Hodgkinson, of the Science and Art Department, South Kensington, to whom I am greatly indebted for so successfully producing 3¼-inch slides, which stood enlargement on the screen in several cases to nearly full-size, and in one to over the full-size of the original objects.—I remain, sir, yours very obediently,

C. PURDON CLARKE.

Indian Section, South Kensington Museum.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 10th inst., Mr. A. L. HENDERSON in the chair.

The discussion on gelatine negatives dissolving in the fixing

bath was again resumed. Mr. Coles having placed plates in new and old hypo solutions for three days, a slightly reducing action took place in the fresh solution, but not any in the old and discoloured bath. Mr. Ashman, to test whether an accumulation of alkali would cause reduction, added ten per cent. strong ammonia to an old bath; no reduction took place in a plate immersed thirty hours therein.

The Chairman said, if negatives were treated with alum, there would be very little chance of the film dissolving; he wished to know if Mr. Newton's formula, given last week, had been tried, and whether anyone had found formic acid to be a developer as claimed? He had made several experiments with formic acid some years ago, and found it reduced nitrate of silver.

Mr. W. M. Ashman said formic acid alone would not develop a gelatine plate. If poured on a film it would dissolve it completely. Concentrated acid would do this in two or three minutes, permitting the whole to be poured off.

Mr. A. Cowan passed round an American cutting wheel, suited for cutting prints against a flat rule. The wheel was much larger than those hitherto sold in this country, and permitted sharpening on an oil-stone with great ease.

Mr. W. Coles showed negatives locally intensified with mercury and Schlippe's salt, illustrating the absence of colour complained of by Mr. Barker. The importance of prolonged washing after the mercury was insisted upon.

The Chairman, speaking of pressure on bromide films, showed several plates much veiled in the shadows, which veil he attributed to the pressure exerted by the strips of cardboard packed between them; a few months ago they were perfectly bright and clear, registering 23 on the sensitomer; where the pressure had been greatest, the markings were opaque.

Mr. W. H. Prestwich had similar markings when he used good cartridge paper for packing; but with common paper, he was free from them.

Mr. W. Cobb attributed the marks to dampness. A few months ago he prepared a special batch of 10 by 8 plates, which took a long time in drying; these were packed with paper not previously dried, and markings resulted. When the packing is thoroughly dry, markings of this kind are absent; he recommended the adoption of parchmentized paper.

Mr. Graham (Derby) agreed with the last speaker; he used common orange paper which had been stored some time in a room always heated to 70° F. by hot water pipes. Some plates made by a similar process to those shown by Mr. Henderson had been so packed for two years; he would forward a few of them to the Chairman to develop. They were quite free from the marks now shown, which he was sure were due to dampness.

Mr. F. York spoke in favour of parchmentized paper.

Mr. A. Haddon recommended Swedish filtering paper.

The Chairman exhibited an opal picture sent by Mr. Crosby, of Rotherham. It was printed out on gelatino-chloride emulsion, and toned as in the collodio-chloride process. He also passed round plates made by mixing a quick and slow emulsion together, some of which occupied half-an-hour in setting, causing a subsidence of the silver bromide, as suggested by Mr. Prestwich, whose idea was that frilling is due to a separation of the sensitive compound, rather than decomposition of gelatine. Another curious thing about these plates was, that one exposed for two seconds through the film—*i.e.*, from the glass side—appeared to have received double the exposure another plate showed, which was exposed three seconds in the ordinary way. Upon motion, Mr. Henderson was requested to act as delegate from this Society when attending photographic meetings during his stay in America.

Mr. Henderson could not promise to attend the Cincinnati Convention, but other photographic meetings he should be pleased to attend in the capacity of delegate.

Mr. A. Richards and Mr. L. Waltenberg were elected members of the Association.

Glasgow and West of Scotland Amateur Photographic Association.

A special meeting was held in the new rooms of the Association, 180, West Regent Street, Glasgow, on the evening of Thursday, the 10th July, Mr. Hugh Reid, President, in the chair.

After the adoption of the minutes, the following new members were admitted:—Messrs. John Colson, David Pratt, James Kirkwood, Samuel Walker, Mr. B. Smith, and James Torrance.

It was agreed that any amateurs visiting or passing through, but not resident in Glasgow, should have the use of the dark room, &c., without charge on the introduction of any member of the Society.

After a little discussion it was arranged that the next out-door meeting of the Society should be held at Kilmun and Holy Loch on Saturday, 9th August; members to leave by the 8.30 a.m. train from St. Enoch's.

The members present were very much pleased with the new rooms, and it is expected that the Association will derive great benefit from the increased accommodation for meetings, and the conveniences of the dark room for developing, enlarging, &c.

After the usual votes of thanks the meeting adjourned.

Derby Photographic Society.

An out-door meeting of this Society was held at Matlock on July 12th. Among those present were Messrs. C. E. Abney, C. Bourdin, S. J. Cholerton, T. Scotton, F. Shute, F. W. Simpson, and R. L. Warham. Starting from Derby at 2.5, the party alighted at Matlock Bath Station, and immediately set out for the well-known High Tor. The weather at starting was everything that could be desired, but no sooner was the formidable array of cameras pointed at the gigantic rock, than a black cloud obscured the sun. "Everything has an end," and this proved true with the cloud, for after waiting patiently for some time the weather cleared up, and the sun shone again. After securing this picture a move was made to the Lovers' Walk, and here the party met two members of the Manchester Photographic Society. Some views of the river and Lovers' Walk having been taken, the members next drove to Cromford, where they met the rest of the members of the Manchester Society, and returned with them to Matlock, where the two Societies tea'd together at the "Peverill" Dining Rooms. The President of the Manchester Society, Mr. J. Pollitt, in the course of a few remarks after tea, invited the Derby Society to join them in an excursion to Dovedale during the summer. The members then separated.

Oldham Photographic Society.

On Tuesday, June 24th, the members of this Society, with a few friends, visited Bakewell, Haddon Hall, Chatsworth, and Rowsley, in Derbyshire. The day was favourable, fourteen cameras were at work, and about one hundred plates, varying from 12 by 10 to stereoscopic size, were exposed. On development the quality of the majority of these plates has turned out satisfactory. After passing an enjoyable day, the party, numbering thirty-one, partook of an excellent tea at Rowsley, and returned by a quick train at 8 o'clock p.m.

The monthly meetings of this Society are now held at the Oldham Lyceum, the first meeting at which place was on the 26th of June, when thirty members attended, Mr. John Risley, President, in the chair.

A good show of work by members was exhibited, and the Chairman brought a new drop-shutter of his own invention before the meeting, the simplicity and perfectness of which won great praise.

Six new members were proposed at the meeting. This Society was established in 1867; it now consists of over fifty members, and is in a most healthy condition.

Photographers' Benevolent Association.

This Association held its usual board meeting on 2nd inst., at 181, Aldersgate Street, E.C. The minutes of the previous meeting were read and confirmed.

Mr. T. W. Cowper was elected a member of the Association. The correspondence and other matters having received attention, the meeting terminated.

Leeds Photographic Society.

The usual monthly meeting of this Society was held on Thursday, July 3rd, at the Philosophical Hall, J. W. Ramsden, Esq., in the chair.

After the confirmation of the minutes, Mr. Whitham was elected a member of the Society.

Mr. Washington Teasdale called attention to a number of very fine lantern slides he had taken on Ramsden special lantern plates. He said the plates were very slow, requiring from thirty seconds to two minutes twelve inches from a fish-tail burner, according to the density of the negative, the tone of colour obtained by pyro being a rich brown; the great characteristics of the

plates being clear glass in the shadows, with the best gradation of tones and half-tones he had ever seen. He also drew attention to two or three slides that had been transferred from the hypo to a solution of alum, the result being a red stain.

Mr. Pocklington had also been using the same plates, and got very fine results, some of the most effective being those toned by immersion in a bath of:—

No. 1.—Nitrate uranium	20 grains
Water	1 ounce
No. 2.—Ferridcyanide potassium	20 grains
Water	1 ounce

Two parts No. 2 to one part No. 1.

In answer to a question as to the cause and best cure for flare in double-combination lenses, it was suggested that flare was very frequently caused by a dirty condition of the front lens.

Mr. Rodwell remarked that the lens attached to one of his cameras always gave flare when used with the smallest stop; and, as a preventive, an additional stop was supplied to fix in front of the other.

In answer to a question as to what was the best way to recover the silver from a quantity of soda and water in which had been disolved the films of several gross of negatives, and was it worth doing,—

Mr. Ramsden suggested a number of methods that might be employed, but thought the best would be to add a quantity of sawdust to the liquid, and then reduce in the ordinary way. But taking into consideration the very small amount of silver used to build up the photographic image, the result would not be worth the trouble.

A Member put the following question:—He had a copyright etching of a very valuable painting. Supposing he were to make a lantern slide from the etching for his own use only, and for private exhibition at his own home to his friends; would he be liable to any prosecution if it were known to the owner of the copyright that he had done so?

A long and interesting discussion on the subject took place. At the close it was generally agreed that in so doing he would be liable to prosecution, and, if convicted, the owner of the copyright could obtain damages. But if the slide was used only in the way described, the damages would be so small that it would not be worth the while of anyone to incur the trouble and cost of a long legal process to obtain them.

An enquiry was made as to whether any of the members had seen the vulcanized fibre that had been recommended for making shutters for dark slides, &c. Although several of the members had heard of it, none had seen it, and it was not known where it could be obtained.

Mr. Teasdale said he deprecated the use of brass for stops, and had used for some time stops made of ebonite as being much better; but thought that if the Willesden paper was supplied in black it would be most useful not only for this purpose, but for many others where thinness, toughness, and lightness were required.

Talk in the Studio.

Photographic Society of Great Britain.— The next meeting of this Society will take place on Tuesday next, July the 22nd, at 8 p.m., at the Gallery, 5a, Pall Mall, East.

Mr. Woods' Remarks on Dark-Room Illumination.—Mr. W. E. Debenham writes to us as follows:—"One point that Mr. Woods addresses himself to is the defence of his use of the term cathedral green. What I object to is the use of that term as employed by Mr. Woods to indicate any particular colour, seeing that blue-green, and yellow-green, each in a variety of depths, would all be included. A matter that Mr. Woods particularly criticises is my statement that green glass (of the colour I showed) is a better protective supplement to stained red than is the cobalt glass recommended by Capt. Abney, and he states as a fact, not as a mere supposition, that the reason I found it so was because I had not employed the precise red used by Capt. Abney. Now, as I showed the results of two experiments with stained red glass, each of them being like the pattern shown by Mr. Woods as Capt. Abney's, flashed red on one side and stained silver yellow on the other, but not precisely of the same depth of colour, one being rather lighter and the other rather darker than Capt. Abney's, and as with each of these pieces the green had given more illumination and more protection to the plate than the cobalt, there seems no probability that the use of a stained red intermediate in depth between these two would cause a reversal of the result. If Mr. Woods, however, is still of opinion that with any shade of stained red glass cobalt is as good a supplement as green, I invite him to send a piece of red and cobalt to any competent independent judges, and I will, on seeing the depth of blue to be competed with, supply a piece of green. I leave Mr. Woods free to select lamp light, magnesium light, or daylight, if he thinks that the choice will make any difference in his favour. He complains of my having used magnesium in this particular experiment, but as this light comes between lamplight and daylight in actinic richness, it seems to me the fairer to use them either alone, when trying mediums that are to be used with both. It is noticeable that Mr. Woods leaves most of my arguments untouched. The proposition that red light has at least as much effect, or more, upon the sensitive film in proportion to its luminosity, as yellow, and which was so strongly exemplified by Mr. Sawyer, cannot be said to be affected by Mr. Wood's experiments and remarks, as the relative luminosity of the red was not taken into account. The arguments that the great difference of relative sensibility of the ordinary gelatino-bromide and collodion bath plates to different coloured light which had so long been insisted upon did not exist, and therefore that the different colour of light required in the dark room in the two cases which had been insisted upon on that account was a mistake; and that the great effect upon the colour-sensitiveness of a bromide plate caused by the addition of iodide was also a mistake; these changes of conditions being favourable to the transparent medium, which happened to be the red—were all passed over; and it is satisfactory to see that Mr. Ray Woods found, after a month's preparation, no answer to my argument."

Some friends of Mr. Scharf, for a number of years Keeper of the National Portrait Gallery, propose to commemorate his services by asking him to sit for a portrait to be permanently placed, with the assent of the trustees, in the board-room of the gallery at South Kensington. A committee has been formed for the purpose of giving effect to the scheme. It includes Lord Derby, Lord Stanhope, Sir Richard Wallace, and Sir Frederick Leighton.

Albumenized Paper for Packing Butter.—The butter should be first wrapped in a linen cloth, and then in a double fold of albumenized paper; at least, so says the *Archiv*. The albumen coating is not easily penetrated by grease, and of course it is easy to make a cheaper albumenized paper than that used for photographic purposes. Thirty grains of nitre to the white of one egg may advantageously replace the ordinary preparation.

Macdougald's Developer Tubes.—Messrs. Marion and Co. send us some samples of these as introduced into the market. Two glass tubes with ends melted together by means of the blow-pipe are supplied, both these tubes being fitted into a block of wood for safety of transit. When the developer is required for use the ends are broken off, and the solutions mixed with the proper quantity of water (see "Patent Intelligence," pages 153 and 219).

The Exhibition of Photographic Portraits.—"Several correspondents," says the *Liverpool Courier*, "having asked the question whether or not photographers have a right to display in their show-cases the portraits which they may take, and conflicting opinions having been given on the subject, we submitted the question to the head of a firm of photographers, who has been courteous enough to furnish the following explanation of the usage with reference to the exhibition of portraits. —'I beg to say that, so far as I am aware, there is no law to prevent a photographer placing in his window a print from any negative he may take of a customer. In the recent Copyright Act a clause was inserted making it illegal for a photographer to so exhibit a photograph of a customer without the consent of the individual represented. But whilst it is not illegal, we should consider it exceedingly improper to exhibit the portrait of any person if it was thought for a moment that it would be an annoyance to the person represented, and no photographer with any judgment would refuse at once to remove such photograph upon request. We have not altogether met with a dozen persons who have objected to our exhibiting, as samples of our work, their photographs, though we are always careful to select such as we think will not be objected to, generally choosing persons of note, members of the theatrical profession, and children's portraits. During all the period we have named we do not think there have been a dozen instances in which we have been asked to remove a photograph from our windows or cases. We

should consider it not only very discourteous to refuse, but, in addition, a very impolitic course to pursue, it being manifestly the interest of the photographer to please his patrons, and not to vex them.'"

FOLIAGE AT CLOSE QUARTERS.—Having always, at our Photographic Exhibition, plenty of views of *distant* foliage, would it not be *apropos* for our brethren of the camera, and especially lady amateurs, to devote themselves to studies of *near* objects in foliage, and other small matters in nature? In almost every garden, if looked for with a discriminating eye, there will be found little bits of foliage, pretty combinations of flowers, all in a natural state; little nooks and corners containing most exquisite arrangements of beauty; aye, and why not make a study of bird-nests, from which the artist painter produces such beautiful little pictorial gems? All these, if taken on a small size, say a half-plate, would not only demand the exercise of artistic skill to make into a picture, but would also be excellent practice in the use of lenses and their stops. Studies like these would show one of the great powers of photography, viz., the possibility of giving detail in all complications of intricacy, and which, when brought to bear upon near foliage, ought to result in some most charming pictures.—*Journal of the Photographic Society*.

STAR MAGNITUDES DETERMINED BY PHOTOGRAPHY.—The Rev. J. E. Espin's printed catalogue contains the magnitudes of 500 stars in *Auriga*, *Gemini*, and *Leo Minor*, all determined from photographs taken with the equatorial stellar camera at the Liverpool Society's observatory. The instrument was presented to the Society by Mr. Howard Grubb, and it has been turned to excellent account. The magnitudes obtained agree fairly well with those of Argelander, and this result speaks well for the future usefulness of a method almost untried, and necessarily beset with the difficulties incident to a new line of research.

PHOTOGRAPHIC CLUB.—At the next meeting, on July 23rd, the subject for discussion will be on "The Effect of Coloured Media on Sensitized Paper." Out-door meeting at Hadley Wood—to High Barnet Station—meeting afterwards at "Old Salisbury Arms."

To Correspondents.

*** We cannot undertake to return rejected communications.

H. EVANS.—1. You can get the gutta-percha foil in small quantities from any druggist, as it is used for surgical dressings; but if you require it wholesale, you should apply to the Gutta-Pereha Company, Wharf Road, City Road, London. 2. Benzole can he obtained where you get your other photographic chemicals. 3. We do not know the price, but you can easily write to the publishers and enquire.

LENS.—The instrument is not suited for the most rapid work, but if you do not require good definition all over the plate, you may enlarge the aperture to half an-inch, or even five-eighths. 2. The flap opening is not so convenient as a cap in ordinary cases.

WM. GAMBLE.—The process to which you refer is not the Pretsch process, but that of Asser, and your failures may possibly result from general inexperience as regards the behaviour of bichromated organic matter. We may suggest the following as the most likely causes of such a general insolubility of the sensitive mixture as would cause the ink to take all over:—(*a*) The exposure of the sensitive paper to the fumes of burning coal-gas, or gases escaping from a drain. (*b*) Extremely slow drying of the sensitive paper. (*c*) The use of paper sized with alum. (*d*) Allowing too long an interval to elapse after exposure, and before soaking out the unaltered bichromate. (*e*) Non-removal of all traces of unaltered bichromate before the application of heat to the exposed sheet. Even when partial insolubility has set in, it is sometimes possible to obtain passable results by the application of warm water. 2. We are glad you have succeeded, and shall be pleased to have a communication on the subject. 3. You are quite right as to the merits of the asphalt process, as it will give much finer results than the ordinary transfer method; and if you get a good specimen of asphalt, and follow the directions—especially as regards agitating at intervals during about five hours—the powder will not consolidate at the bottom of the bottle, and you will have no difficulty. There is no need to work in the dark. Read the information as to the kind of asphalt to select.

WM. BIRRELL.—1. Between four and five ounces. 2. Probably not less than ten times. 3. The formation of the bromide of silver in coarse curds. 4. It would be so if the sides were exactly vertical, but the sides are never vertical. Consider how your theory will hold when a series of easy gradations is concerned.

R. X. R.—Dilute nitric acid is best, about one part with forty of water. A series of articles on the subject appeared in our volume for 1882, pages 673 to 770.

W. LAWRENCE.—See page 6 of our present volume.

W. H. HARRISON.—You have, apparently, overlooked the concluding paragraph on page 440, where attention is called to the danger of which you speak; but we are very much obliged to you, and you will see that we have again referred to the matter.

NOVICE.—Obtain a four-inch stove-pipe elbow and pass one branch of it horizontally through the external wall of the dark room, the bent part being inside, and the mouth directed upwards. To the external end of the horizontal arm attach a second elbow with the open end directed downwards.

F. C. B.—On a main route, such as that which you intend to follow, there is not much probability of any trouble in getting the dry plates through the Customs. Simply explain what they are, and if the officer insists on opening the packages, demand to have them opened in a room illuminated by your own lantern. This might possibly cause you to lose your train. There is no duty chargeable.

FRANK GORSTON.—As far as it is possible to judge from the details you give, your general plan of working is good, and we cannot very well suggest a probable cause of your failure. Possibly you may be using a sample of sodium sulphite contaminated with carbonate. See Note as to this matter on page 441.

AGENCY.—There is nothing of the kind at present, as such business is usually transacted through the advertising columns of the PHOTOGRAPHIC NEWS.

CARBON.—It was at one time thought that considerable advantage resulted from the addition of soap to the composition, but we believe that it is not used at the present time.

BEGINNER.—The prints have been insufficiently fixed. Allow them to remain longer in the hypo bath. Remember that the solution is very cold when freshly prepared, and that it is far less active than at the ordinary temperature.

JOHN B.—1. Acetic acid answers very well, and is to be preferred to a stronger acid; but if you are careful there will be no difficulty in obtaining a good result with nitric acid. 2. Yes.

W. G.—Eder's method of intensification with lead is one of the best. The well-washed negative is immersed in a solution containing six parts of potassium ferricyanide and four parts nitrate of lead dissolved in one hundred parts of water. When this has become yellowish it is well washed, and the plate is allowed to remain in a bath compounded of one part of sulphide of ammonium and four of water. With this latter it becomes intensely black.

The Photographic News Registry.

Employment Wanted.

Printer & Toner (age 19).—A. B., 45, George-st., Hastings.
Assistant Operator or Retoucher (25 s.).—A. Z., *Photo. News* Office.
Manager, good Poser.—M., Mr. Nicholls, High-st., Shanklin, I.W.
Operator, good all round.—B. M., 3, Laurel-ter., Park-lane, Tottenham.
Assistant Operator, high-class.—W. H. May, Poolend-st., Malvern.
Dry-plate Examiner & Packer (lady).—M. Latimer, 9, N. Audley-st., W.
Recep.-room, Spotting, &c.—F. P., 12, Dorchester-pl., Blandford-sq.
General Assistant.—H., 115, Westmoreland-rd., Walworth.
General Assistant, Printer, Vignetter.—B. R., *Photo. News* Office.
Recep.-Room, Spotting, &c. (15 s.).—H. K., 75, Azenby-sq., Peckham.
Retoucher, or Operator & Retoucher.—C. N., 310, Gray's-inn-rd.
Oper., exp. with dry plates.—L., 23, Orbel-st., Castle-st., Battersea.
Retoucher (young lady).—L. Francis, 16, Linom-rd., Bedford-rd., Clapham.

Employment Offered.

Lady as efficient Spotter.—Maull and Fox, 187, Piccadilly, W.
Retoucher, Colourist, Spotter—2, The Pavement, Clapham Common.
Retoucher, first-class.—25, Old Bond Street (first floor).
Reception Lady.—C. F. Wing, 13, Beak-st., Regent-st. (Friday 6 to 8 p.m.)
Operator to manage small Studio.—E. Taylor, Eastboro', Scarboro'.
Printer, Toner, Mounter (male or female).—W. J. Suter, Cheltenham.
Operator for first-class work.—P. G., 328, Upper Brook-st., Manchester.
Printer, for permanency.—J. S. Catford, 5, High-st., Ilfracombe.
Youth, as Assistant Printer.—Ergland Brothers, 25, Charles-st., W.
Retoucher.—Van der Weyde, 182, Regent-st., W.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1351.—*July* 25, 1884.

LIBRARY

CONTENTS.

STRIPPING GELATINE NEGATIVES OR POSITIVES BY THE AID OF HYDROFLUORIC ACID.

OUR readers will remember that in 1882 we published a method of stripping the film from gelatine negatives by the action of hydrofluoric acid, and we have commented several times on the ease and convenience with which the separation of the film from the glass can be effected, but M. Bory has recently published* a suggestion to use hydrofluoric acid for a similar purpose, apparently without knowing anything about Mr. Plener's prior publication. As, however, M. Bory appears not to have worked out the practical detail of the method so thoroughly as was the case with Mr. Plener, we will now point out the main features of the proeess as given on page 225 of our volume for 1882.

Mr. Plener's method of stripping is best carried out by building up a wall of cardboard strips round the negative, and, after levelling, pouring on a warm solution of gelatine. When the film is dry, or nearly so, it is immersed in the dilute acid until it can be easily stripped off, after which it is rinsed thoroughly, and allowed to dry. If the wet film be carefully squeegeed down on a sheet of waxed glass, it can be easily separated as soon as dry, and under these circumstances the film negative is of course obtained with a beautifully even surface. Another method, which may be occasionally useful, is to immerse the stripped and still wet film into a bath of methylated spirit, a proceeding which causes the swelled film to rapidly shrink to near about its original size; after which drying between sheets of blotting-paper serves to remove almost every trace of spirit, so that the negative may be ready for printing from in a very short time.

When a positive on paper is wished for, it is very convenient to make the picture on a plate in the first instance, and then to transfer it to paper. In such a case the positive picture on glass may first be coated with a thin layer of gelatine, to which a sheet of smooth-faced paper is next attached, or the paper itself may be brought into contact with the film under a warm gelatinous solution, as when prints are mounted in optical contact with glass; remaining operations being so similar to those already mentioned as to require no special description. Mr. Plener has shown us many pictures which had been transferred to paper in this way; and those negatives which had been transferred to a fine or close-grained paper had evidently lost none of their printing qualities, exeepting so far as the paper backing would, unless waxed, eonsiderably retard the process of printing.

Mr. Plener also pointed out that hydrofluoric acid is an extremely valuable agent for cleaning glass plates (PHOTOGRAPHIC NEWS, 1882, p. 232), and so many have adopted and described this method of cleaning plates to whieh foreign matter adheres with exceptional tenacity—that we are rather surprised to find that M. Bory recommends it for the purpose without any referenee to its previous use in this connection.

M. Bory uses one part of strong hydrofluoric acid to about two hundred and fifty of water for stripping the film, and one part with fifty or a hundred of water for cleaning glass; but we have used it with advantage of this latter strength for separating the gelatine pelliele from glass.

M. Bory says nothing about the use of aleohol for causing the expanded film to eontract to its original dimensions, and it may be mentioned that, as in most cases the stripped negative is required to be of the same size as the original, it is of very great importauce to be able to bring back the exposed negative to its original size.

Mr. Plener also suggested the use of moderately diluted sulphuric acid for the purpose; but it is hardly so convenient as alcohol, owing to the difficulty of removing the last traces of acid except by long washing in alcohol; still, by the use of sulphuric acid, the stripped negative can be re adily reduced to less thun its original dimensions.

* *Bulletin de la Société Française de Photographie*, XXX., p. 183.

FINISHING PHOTOGRAPHS.

INDIVIDUALITY is as often discernible in the ultimate finish of a photograph as in skilful posing, management of lighting, or arrangement of accessories; and keen business men, being convinced of this, take care their reputation shall not suffer from indifferent retouching, printing, mounting, &c., any more than they would tolerate the employment of a bad batch of dry plates, resulting in negatives of scarcely mediocre quality. All photographers are not keen business men, however, or the opportunity would not occur to point out a few of the bad traits met with in every-day photography. It has often been remarked that "a good picture is worthy a good frame." If sueh is the case, then a good print should be worthy a good mount; but it does not always become attaehed to one. The difference in the cost of good mounts and those of an inferior quality is very trifling, and it is not any more difficult to mouut pictures neatly and cleanly, than it is to perform the operation carelessly, so that it is a little difficult to understand—with nearly half a century's experience before us—how sueh a mechanical department as finishing should be open to severe criticism.

Twenty years ago, when mounts were more expensive, and the rolling-press did the duty now performed by the burnisher, one scarcely ever saw scratches, scorchings, tears, broken edges, and twisted mounts; neither was it eustomary to ornament (?) the mounts with a mixture of

oil and soot. Prints intended to be flat were made so, and convexing was carefully done, as many of the "Diamond cameos" then in vogue still remain to testify.

The Diamond cameo photograph was one of the most effective styles of portraiture that has yet been introduced; moreover, it was exceedingly popular with the public; but owing to certain restrictions—which have ceased to exist—it did not receive that support from the profession generally, which was necessary to ensure its continued success.

It will be within the recollection of some of the readers of the NEWS that this class of picture, which was introduced by Messrs. Window and Bridge in 1864, consisted in taking, by means of a suitable registering dark slide, four busts giving different views or positions of the same head on one plate. From the negative so obtained, and suitably masked, prints were taken, which, after mounting, were embossed in a press fitted with dies corresponding in shape to the printed portions, the result being a series of four convex portraits on a white ground—carte-de-visite size. The drawback these pictures were liable to, was unskilful posing and lighting, a defect which would hardly be likely to operate against them should they be again placed in competition for public favour. Since the period mentioned, retouching and Rembrandt lighting have been introduced; the tendency, too, has been growing in favour of larger sizes, therefore it seems highly probable that the introduction of the essential elements of this old favourite, embodying some of the later improvements, such as increased size, effective lighting, mezzotint grounds, border printing, gelatine enamelling, &c., would, in the hands of a few energetic photographers, prove a success.

From observation it will be noticed that the public, as a rule, are more fastidious over the finish of a photograph than the technicality involved in negative-making or the printing thereof; that they are exacting as regards colour, it is true; but having formed an opinion of the photograph as a portrait or pictorial representation, they devote a full measure of attention to the details of finishing.

Enamelled surfaces appear to be much appreciated for sizes up to Boudoir; when nicely mounted they please the public, but whether the high glaze is artistic or not is quite another matter, which does not concern us just now, it being sufficient for the purposes of this article to mention that a very large proportion of these highly glazed prints are daily put into circulation. Unfortunately, the tendency of air-bells forming during the glazing process causes a good many defective prints to be sent out, while the supposed difficulty of removing the spots which are caused in printing deters many from adopting it. The latter difficulty does not in reality exist, since by mixing the touching-out colour with spike oil instead of water (as frequently recommended in these pages), the colour remains, the solution of gelatine having no tendency to remove it. A full description of the methods ordinarily adopted for obtaining enamelled surfaces with and without gelatine will be found at page 330 in the last volume of the PHOTOGRAPHIC NEWS. The majority of glazed prints being embossed, it may not be considered out of place here to say that the duration of convexity is largely influenced by a padding of cotton wool, which is placed in the space that exists between the embossed photograph and the flat mount used as a base. When this padding has been neglected, it requires very little atmospheric change to cause a depression in the centre of the shape, and thus mar the work. Before leaving the subject of enamelling, it might be worth mentioning that pads of cotton wool laid between convexed prints during their transit by post tend in a great measure to avoid damage, without sensibly increasing the weight; while the plan of appending a label bearing the address and postage stamp, and wrapping the package in *black* paper, does away with the risk of the photographs becoming marked by an over-zealous manipulator with the date stamp.

Those who do not care to push their work to the limit of enamelling, and are content with the results obtained by the burnisher, are apt to be troubled a good deal by loss of convexity. Stout mounts retain their shape longer than thin ones, but are more liable to burst under considerable pressure; the best results being obtained when a mount of medium thickness is used, and a little moisture is present. When the mounts are very dry, embossing is not satisfactory; the same remark also applies to burnishing with still greater force, since its importance has the most potent influence on the attainment of perfect results.

Scratches detract very much from the value of a photograph, and may often be seen on burnished prints. If every print were well rubbed with a piece of clean cambric after lubricating, and before burnishing, less scratches would be observed. When scratches make their appearance the burnishing tool should be well rubbed on an emery knife-board for a few seconds, which generally removes the offending particle.

Soiled and damaged mounts offer the very best evidence of general carelessness, and a very good estimate may be formed of the general characteristics of a business house when callousness is shown in this particular. Let the negative be ever so good, and no matter how much care has been exercised in retouching and printing it, the value of the work becomes largely depreciated when, after mounting, it is surrounded by dirty finger-marks, creases, tears, jagged or otherwise damaged edges, also blurred or indifferent letter-press printing.

Besides slovenly finishing, slovenly packing has its influence on the public mind, and should be avoided in all cases. Photographs are frequently sent through the post with little more protection than is afforded by an ordinary envelope, which offers every facility to the officials to damage the work by stamping, cording, or forcing into the letter-box, thus causing disappointment at the outset. Much more could be said on this important subject, but the space is already exceeded; it must therefore be deferred until a future opportunity presents itself.

By-the-Bye.

PRINTING PHOTOGRAPHS BY MACHINERY.

Is a collotype, or an impression from a phototype block, a photograph? Here is just one of those troublesome questions which can never be answered, and which may be discussed to infinity without any result. All, indeed, depends on the sense in which the word "photograph" is used; and in the present day, when impressions by photo-mechanical methods are so common, it is perhaps as well to include such prints under the designation photograph, instead of limiting the word to those pictures of which each individual copy has been formed by a separate exposure to light. Every picture which fairly owes its origin to the camera, and in the re-duplication of which the mind or hand of the artist has taken no part, may be fairly called a photograph when the term is used in its widest sense.

Those, on the other hand, who prefer to use the word photograph in a more restricted fashion will only consider a picture as being a true photograph when light has exercised a special action in producing the copy under consideration; no such productions as collotypes, Woodburytypes, photo-block prints, photo-lithographs, or heliographic engravings being regarded by them as true photographs.

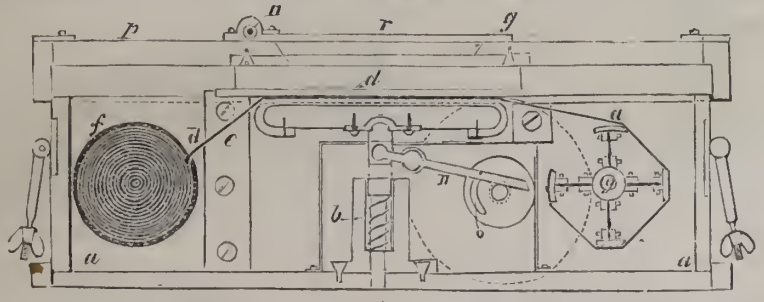
It is so usual now-a-days to connect the rapid production of photographic pictures with a photo-mechanical method, such as Woodburytype or photo-lithography, that but

little attention has been given to the possibility of rapid photographic printing by methods involving a special exposure to light for each individual print.

As stated in the Photographic News of last week, Colonel Hoe, a member of the celebrated firm of Hoe and Co., New York, has recently expressed an opinion that ordinary printing methods may ultimately give way to photography, a beam of light being flashed a hundred times a minute through a negative, and the impression being received on a moving web of sensitive paper.

Colonel Hoe's suggestion, although of some interest as coming from such a quarter, is by no means novel. On page 270 of our volume for 1860 there is an account of a machine constructed by Mr. Fontayne, of Cincinnati; this machine being capable of giving no less than two hundred exposures a minute on a band of sensitive paper, or at the rate of twelve thousand per hour, just double the number which Colonel Hoe suggests as possible. Fontayne did not use the electric light, but used sunlight concentrated upon the negative by means of a large condensing lens; and at a meeting of the American Photographical Society held on August 13th, 1860, Mr. C. H. Babcock exhibited bands of photographic prints obtained by means of the Fontayne machine. The principle of the machine is simple. A band of sensitive paper is set beneath a negative, and drawn forward at intervals; the pressing of the paper into close contact with the glass and the opening of the shutter by which light is admitted being performed automatically by suitable mechanism. Some editorial remarks, which will be found on the second page of our volume for 1883, refer to the possible use of the Fontayne machine for newspaper work, and in the same volume will be found (p. 531) mention of the machine-printed photographs exhibited by Dr. Just at the Brussels Exhibition; while in another place (p. 771) is an account of the form of the Fontayne apparatus recently patented by Herr Schlotterhoss, who has called prominent attention to the matter, so it may be well to once more give a short description of the arrangement as carried out by Schlotterhoss.

What one may call the platen of the press, or the padding of the frame, is central in the accompanying drawing, and when this platen is brought into action, it is forced up towards the negative by a spring, *h*, the negative being held by rebated and adjustable strips, *e e*; and, at other times, the sensitive material can pass freely between the plates and the negative, as it is drawn off the stock roller, *f*, on the left-hand side of the platen, towards the receiving roller (or cross), *a*. A slide, *z*, serves to cover the sensitive paper when it is necessary to change the negative. A cover or exposing shutter, 2, turns on a spindle, *h*, and this shutter



is opened by a cam at the moment when the platen presses the tissue against the negative. The general action of the apparatus, and the functions of the various mechanical organs, are sufficiently elucidated by the drawing.

Perhaps one may be hardly justified in expecting the photographic printing machine to come into general use just at present as a competitor of the usual type printer, but as highly sensitive bromide emulsions can now be made to yield excellent positive prints on paper, our readers would do well to ascertain how far they can profitably employ the Fontayne machine for the rapid production of photographic prints.

As bearing on the subject of rapid printing, it must not be forgotten that the mechanical photographs obtained by the agency of lithography or typography are already finished when they leave the machine; but that the operations of development, fixation, and washing are necessary after the band of paper leaves the Fontayne apparatus; still there would be no insuperable difficulty in making the development, fixation, and washing automatic.

Now that the quick production of photo-mechanical prints is a matter of every-day practice, let us hope that the automatic printing machine may be no longer neglected.

BRUSH AND CAMERA IN WALES.

BY H. P. ROBINSON.

Are readers tired of hearing of what others have done, descriptions in cold words of delightful hours, or is there room for one more paper on where we have been with the camera?

The anticipations of a well-organized holiday and the remembrances of a perfect success are often more enjoyable than the actual realization. However that may be, nothing could be more enjoyable or enjoyed than our "Artists' Party," as it has always been called, in North Wales, in 1884.

These same parties have become respectable from their age, for they are now a venerable institution. Not always on land, for some of them have taken the form of yachting; but for several years they have come off in North Wales, where a useful relative, whose special mission in the world is to find enjoyment for others, and pick up by the way a few crumbs of the pleasure himself, if he can, incidentally, rents a shooting estate whose covers in Autumn supply sport on the largest scale, and which, with the river in summer, is one of the loveliest spots in the most beautiful part of the Kingdom.

This estate is not the one on which I have photographed during the last three or four years. Owing partly to the operation of the Ground Game Act, which seems to have been passed for the purpose of setting landlords and tenants by the ears, and breaking contracts, we shall see no more of Gwysaney. But all things happen for the best if you will only think so; it was a paradise in its way, and the grand old hall was delightful, but I was beginning to feel, or tried to persuade myself, I had used up the best parts of it, and the change to Gelli Gynan has given me the run of another place differing greatly in the character of the scenery.

The party met at Euston Station about the middle of June, and consisted of several artists whose works are well known to frequenters of exhibitions, and some to whom hope at present has only whispered a flattering tale. A merrier party seldom went by train. On our way the subject, which always seems to come on for discussion when painters and photographers get together—"What is an artist?"—cropped up. The discussion was hot, but

we unanimously agreed that the owners of a good many well-known names in art, including a fine collection of Royal Academicians, were not artists. It was also generously conceded by the painters that it was not the materials a man used that made him an artist, but the way he used them—this from the material painter who cares only for the way a thing is expressed, and not the quality of the subject, so that it was not pretty, like a Christmas card. The ideal painter was inclined to think that the true artist was the one who had the greatest thoughts, it mattering little how they were set forth so that they were expressed according to the rules of art. But a third painter, whose pictures are conspicuous in the Academy and Grosvenor, settled the matter by enunciating the following definition :—"The man who does what he can do is not an artist; the man who does what he cannot do *is* an artist." So it was settled that, to be an artist, requires the achievement of the impossible! I hope this settlement of a much-discussed question will suit all sides of it, and all photographers who wish to be considered artists had better at once look out for miracles.

Arriving at Chester, we had an hour to wait, which enabled us to take a walk into the town and admire the curious and very picturesque Rows. Then, in half-an-hour more, we arrived at Mold, where we were met and driven seven miles through lovely country, on a glorious summer evening, to Gelli Gynan.

Now to be seven miles from a railway station is a delight in itself.

Gwysaney was made beautiful by its magnificent timber : Gelli cannot boast of many exceptionally fine trees, but the compensation comes in a heather-covered mountain, with grouse, overlooking the Vale of Clwydd; an extensive and very wild looking lake, or tarn, situated half way up the mountain; and two or three miles of the river Alyn. These are the three great features of the place, filled in with all the beauties such a country would suggest; but for my purposes, the great attraction of this kind of place is its solitude. Here you can do as you like; here your models can dress as they please, and no prying eyes come to disconcert the photographer and turn his mind away from the composition of his picture to how best to get rid of the intruders. I can always be satisfied with any moderately picturesque scenery, providing I can have it to myself. In the retired parts of Wales the few natives soon get to know you and give you all the help they can—always excepting that they do not care to be photographed. The belief in the evil eye and kindred superstitions still exist in Wales. They believe that the painter or photographer takes something necessary to their life from them. Three years ago, as I think I have said in a former paper, I had great difficulty in getting a Welsh girl to allow me to photograph her. I have only just discovered that her reluctance was due to this superstitious feeling, and it is a curious and startling coincidence that the girl died three months afterwards, a circumstance which was proof positive in the eyes of her friends of the truth of the belief.

The first duty of a photographer when he goes to a new place is to prospect it and see of what it is artistically capable. I was at Gelli last November for the shooting, and occupied part of the time in looking out for pictures, making sketches for subjects as the scenes suggested them to me; but I now found that my preparations were not of much avail, for nature presents a very different aspect in summer to what it does in winter, as I ought to have known. It is seldom worth while, and is always a loss of time, to rush all over a place for subjects, when you can get them pretty close together; so we agreed to *do* the place in sections, and as the river, or about a mile of it, suited the painters as well as myself, we elected to pass our time on its banks, leaving the mountain and the lake for future use. Now, in November the river was full of water, in June it was nearly dry—this being the dryest summer for fifteen years, and the sheep were dying on the hills—presenting a quite different class of subjects. But these were very easy and obvious ones. What artist, whether painter or photographer, can resist such subjects as stepping stones, fords where the river crosses the road, and the bed of a rocky stream, and a three hundred year old mill, and a two hundred year old miller, for this genial old gentleman said he (must I explain? he meant his family) had lived all those years at the mill. In his delightful Cymraeg-English he said, "It is two hundred years tomorrow-day since I shall see it." His great desire was to travel and see the British Museum, where he heard all the pictures were. Being a man who read his newspaper weekly, and knew the world, he defied the superstitions of his country, and did not entirely believe that being photographed would accelerate his death; he therefore appears in several of my pictures. The miller was a great treat to us, and made himself useful. The mill was useful, if dusty, for stowing our heavy apparatus in, and he literally placed at our disposal his ox and his ass and everything that was his, for he was a farmer as well as a miller, and had cows, and calves, and donkeys, and pigs, and there was an amiable young bull that always came up to "assist" in our operations. The miller, too, could give advice upon occasion. One morning I was evidently going to waste a plate on a scene that would be better lighted in the afternoon, and he said, with the air of a judge, "It will be betters perhaps before if you will take it afters." And he got a charming "rise" out of one of the painters who was finishing a two-foot canvas by saying, "I suppose you will take that for a pattern, and do the others that you want with the machine."

With all these adjuncts to picture making, to which may be added a picturesque game-keeper who carried my camera, and three or four "models" dressed in the clothes of the country, the making of pictures was an easy matter.

It is quite impossible for anyone who is in the habit of composing pictures to help getting them when he has such capital materials to his hand. He scarcely requires to have ready-made ideas; ideas, as it were, *jump* upon him. Happy thoughts arise to time with the greatest punctuality. But all this must be by the kind permission of the wind, of which we had more than enough. A slight breeze will sometimes make a close scene with figures impossible. It is easy enough to wait and take snatches of exposure between the gusts if you have no life in your picture, but with models and near trees in the same subject the difficulties are increased a thousandfold.

It often happened that a subject occurred and was secured in a few minutes, with very little demand on the skill of the photographer. As an example, I will mention one subject, for which I can only take the credit of seeing it when it happened. One day I could not have the keeper who usually attended me, and I had to take an undergardener. This man was a pictorial treasure. He was old, and had scarcely been further from the estate than Mold in his life. He was essentially a happy-looking old man, and full of native wit. I had been looking for a view some way off, and returning, saw my old man sitting on a rail in the hedge, surrounded by the models, who were chaffing him in Welsh and English. They made a picturesque group, and I heard one of them say, "He never told his love." Here was subject and title together, and was at once secured.

I don't think I need trouble my reader with anything but the photographic part of the trip. It is not necessary here to say anything about the fishing, which was not very successful, owing to the want of water, but the energy of one of our number supplied trout for breakfast every morning; or the tennis, of which there was a furious hour or two every day; or the visits to the young pheasants, of which vast numbers are reared, and which I hope to meet again in November; or the indoor amusements,

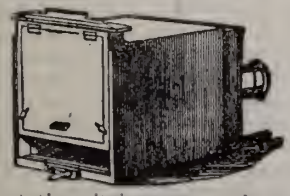
which sometimes carried us so far into the night that we saw the sunrise and heard the early village cock do salutation to the morn. But we consoled ourselves that towards the end of June there is no real night according to the almanacks, so what else could we do?

But have I said anything photographic? Have I said anything that would be of use? Have I, in short, been eminently practical? Not a bit of it. I perhaps ought to have been so, but I meant this at starting to be a purely holiday paper.

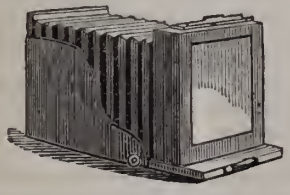
Practical Papers for Beginners.

No. 2.—PREPARING FOR WORK WITH THE NEW CAMERA.

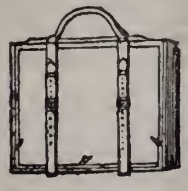
Any convex lens—as, for example, an ordinary reading glass—will be seen to form a picture of a landscape if a sheet of white paper be held up to receive the image at the proper distance behind the glass, but we have not the remotest intention even to allude to the optical laws which govern the formation of an image by a convex lens; still we may remark that opticians have succeeded in constructing compound lenses which are very much better for photographic purposes than any single magnifying glass can be. The photographic camera in its simplest form is a box with a lens at one end, and at the other a pane of ground glass; this glass being set in a sliding frame, which frame can be removed at pleasure, and replaced by a shallow light-proof box, in which the sensitive plate is carried from the dark room to the camera. This shallow light-proof box, ordinarily called the dark slide, and the simplest form of camera, are sketched in the subjoined diagram; but the dark slide is shown as not quite down to the bottom of the groove in which it slides.



At the present time it is very usual to make cameras with compressible bodies, a bellows something like that of a concertina being provided, and such a folding camera is



very convenient when the apparatus is to be used away from home, as, when compressed, the camera forms a nearly solid block of mahogany and leather which may be conveniently carried by means of a strap.



After the beginner has examined his camera, and learned how to open and close it, the tripod stand may be put together, and the camera mounted upon it: a screw for this purpose being ordinarily provided with the camera.

Sometimes a stand with divided legs is used, the lower branch of each leg being capable of sliding between the upper branches, an arrangement which is convenient for the

traveller, not only on account of the fact that the length of the packed stand is reduced to about one-half of what it otherwise would be, but it is also a very great advantage

to be able to shorten one leg of the stand when working upon uneven or hilly ground.

Let us now suppose the apparatus to be firmly mounted upon its stand, and the lens placed in position. The first thing is to see that all working parts fit properly, that the frame bearing the ground glass (focussing screen) works freely on its hinges or in its grooves, and that the dark slides can be placed in position and removed without involving the use of so much force as to put the camera out of gear. Most cameras are now provided with a rack-and-pinion action for adjusting the focus, and it is well to run the movable part along the whole length of the rack once or twice, taking care to search out the cause of any unsteady movement or difficulty in working the pinion. A black cloth must be provided, not only for covering the camera during exposure, but also as a shade to enable the luminous image to be distinctly seen on the ground glass. Many use black velvet; but a fine quality of black woollen cloth, such as coats are made of, is perhaps to be preferred. Having covered the lens with the leather cap—which, by-the-bye, must fit quite easily—the camera is taken out in the full light, and after having removed the ground glass focussing-screen, the black cloth (focussing-cloth) is carefully tied stocking-fashion round the open end of the camera, so as not to lap over the cabinet work more than can be helped, and diligent search is made for any minute holes or cracks which may admit stray beams of light, the head being pushed up into the tube formed by the focusing cloth. It is hardly possible to give one universal prescription for stopping out light, as it may not only enter through a minute pinhole in a joint, through a perfora-

tion in the material of the bellows, or by ill-fittiug arrangement of the sliding front; but any one of a dozen faults in the workmanship may make the camera pervious to light. Slips of shaving moistened with glue may be used to fill out chinks in bad work, and little patches of thin leather glued on may be used in other cases.

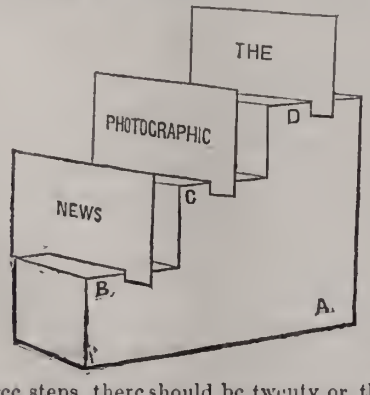
Next remove the cover or cap from the lens, and direct the instrument toward a brightly-illuminated sky, and take an observation inside as before. This time all those parts of the inside of the camera and lens-mount which become brightly lighted up should be noticed, and an attempt should be made to reduce the amount of stray light reflected from them by the application of a mixture of starch paste and lamp black, or by covering with black velvet, this being glued on with the ends of the fibres or "nap" directed towards the aperture of the lens.

It is well known that ordinary white light is a composition of many tints of coloured light, the decomposition of a beam of ordinary light into its component tints by a prism being exemplified in the case of the ordinary prismatic lustres used for decorative purposes; and it should be remembered that the coloured radiations which affect the sensitive plate most energetically are not those which produce the most vigorous impression upon the eyes. In a well-constructed photographic lens, the optician makes an adjustment to make the photographic focus coincident with the visual focus, so that if a view is focussed as to appear on the ground glass with the maximum of sharpness, the position occupied by the ground glass will be exactly that best suited for obtaining a sharp impression on the sensitive plate. Not only is this correction sometimes made imperfectly—especially in the case of the cheaper lenses—but it occasionally happens that the camera is so badly adjusted that the position of the sensitive plate in the dark-slide does not exactly coincide with the position occupied by the ground glass of the focussing-screen.

If the beginner has but one lens, and he intends always to use this on the same camera, it is easy to test for both faults conjointly, and to apply a correction which shall correct either or both faults.

For this purpose take a board about an inch thick, and cut a series of steps along one edge of it, and in the tread of each step make a saw-cut, a small piece of card, upon which there is printed or written matter, being now placed in each saw-cut.

The subjoined drawing represents the arrangement as far as three steps are concerned; but instead of only



having three steps, there should be twenty or thirty, each card being about an inch apart.

Place this "focimeter" on a table or other support, about the same height as the camera-stand, and adjust the camera opposite to it, so that an image is formed which will extend about two-thirds of the distance across the plate. It is convenient to so place the camera on the tripod that one leg comes exactly behind the instrument, and having firmly planted the two remaining legs in front, it becomes easy to make all adjustments as to level and inclination with the hind leg; and as during the work this hind leg goes conveniently between the legs of the photographer, the chance of capsizing the camera is less than it would otherwise be.

The middle card is now carefully focussed with the full aperture of the lens—that is to say, any movable screens or diaphragms which are intended to reduce the amount of light passing through the objective are removed. In order to ensure the production of the sharpest and best defined image of the printing or writing on the middle card, it is convenient to use a magnifying-glass while the adjustment is being made with the sliding part of the camera; and it is scarcely necessary to say that the head and the back of the camera must be screened with the dark cloth while the work of focussing is in progress.

When the central card is focussed sharply it will be noticed that there is a gradual falling off of sharpness as regards the remaining cards, those at the two extremes of the series being probably quite indistinct; and the object of the experiment is to find if the card which gives the sharpest and best defined image on the ground glass will yield the sharpest impression on the sensitive plate. As our next practical paper will deal with exposing and developing dry plates, we will defer our directions for actually making the trial on a sensitive plate.

PHOTOGRAPHIC AND SPECTROSCOPIC OBSERVATIONS AT GREENWICH DURING THE PAST YEAR.

BY W. H. M. CHRISTIE, ASTRONOMER-ROYAL.

The solar prominences have been observed with the half-prism spectroscope on 21 days, and four sun-spots have been examined on 5 days with reference to the broadening of lines in their spectra. Displacements of the hydrogen lines in the spectra of the prominences and chromosphere, and reversals of the metallic lines, have been noticed much more frequently than in preceding years.

For the determination of motions of stars in the line of sight, 412 measures have been made of the displacement of the F line in the spectra of 48 stars, 91 measures of the *b* lines in 19 stars, and 2 measures of the D lines in one star, besides measures of the displacements of the *b* and F lines in the spectra of the east and west limbs of Jupiter, and in the spectra of Venus and Mars, and comparisons with lines in the moon or sky spectrum made in the course of every night's observations of star-motions, or on the following morning, as a check on the adjustment of the spectroscope. Some preliminary measures have also been made of the F line in the spectrum of the Orion-nebula. The progressive change in the motion of Sirius, from recession to approach, alluded to in the last two reports, is fully confirmed by numerous observations since last autumn, and a change of the same character is indicated in the case of Procyon. A discussion of the measures of all the stars observed here, on which I am now engaged, shows that the results of the four periods—1875 June to 1877 May, 1877 June to 1880 December, 1881 January to 1882 March 10, 1882 March 11 to 1884 March 31, in each of which the instrumental conditions were different—accord generally within the limits of the probable errors, and that there is no systematic change from recession to approach, so that the presumption against error arising from defective instrumental adjustment appears to be strong.

The spectrum of Comet *b* 1883 (Pons-Brooks) was examined on two nights, and at the request of Dr. Konkoly a search was made on five nights for bright lines in the spectrum of η Ceti, but their supposed existence was not confirmed.

In the twelve months ending 1884 May 20, photographs of the Sun have been taken on 219 days, and of these 507 have been selected for preservation. There were 4 days on which the sun's disc was observed to be free from spots.

The mean spotted area of the Sun was slightly greater in 1883 than during the preceding year, although the faculæ have shown a small falling off. For the year 1883 Greenwich photographs are available on 215 days, and Indian photographs filling up the gaps in the series on 125 days, making a total of 340 days out of 365 on which photographs have been measured. In 1882 the total number of days was 343, viz., Greenwich series 201 days, supplemented by Indian photographs on 142 days.

By the application of a new secondary magnifier and longer camera, the Dallmeyer photo-heliograph has been adapted (since April 4) to take eight-inch photographs of the Sun instead of four-inch. A new and improved micrometer adapted to the measurement of photographs of the Sun up to 12 inches in diameter has been made by Messrs. Troughton and Simms, and is now used exclusively in the measurement of the solar photographs.

The Indian photographs received from the Solar Physics Committee have been measured to the end of 1883, and the measures have all been completely reduced so as to exhibit heliographic latitudes and longitudes of spots and areas of spots and faculæ.

The continuous record by photography of changes in the magnetic declination, horizontal force, and vertical force, and of earth-currents, has been maintained with perfect regularity, whilst absolute values of the magnetic elements are determined periodically by eye-observation.

The time of vertical vibration of the vertical magnet has been adjusted (relatively to the time of horizontal vibration), so that the same length of ordinate on the photographic sheets represents very nearly the same absolute amount of disturbance for vertical force as for horizontal force and declination. The movements recorded in the three elements are thus immediately comparable.

The identity and insulation of the earth-current wires have been recently tested and found satisfactory, except that the insulation of the "Blackheath" line seemed a little defective.

The new position of the Dip and Deflection instruments in the new Library appears to be generally satisfactory.

The ironwork of the Lassell dome did not affect the magnetic registers in the slightest degree when it was brought into the South ground on 1883 December 31. Although there is a large mass of iron in the Lassell equatoreal and dome, it is at such a distance from the magnets, and so nearly in the magnetic meridian passing through the declination magnet, that no appreciable effect was to be anticipated.

As regards the magnetic reductions, the eye-observations of the upper declination magnet, and of the horizontal and vertical force magnets, are completely reduced to the end of 1883. The time-scales for declination, and horizontal, and vertical force are complete to the end of 1883, and the base line values, deduced from the eye-observations, are entered on the photographic sheets.

The hourly ordinates of the photographic curves are read out to the end of 1883 for declination and horizontal force. The daily and hourly means are taken for declination to the end of 1883, and for horizontal force to last June. The time-scales for the earth-currents are laid down to the end of August 1883. The observations of dip are completely reduced to the present time, and those for absolute horizontal force to the end of 1883.

In the year 1883 there were only five days of great magnetic disturbance, as against 15 in 1882, but there were also about 30 days of lesser disturbance, for which it appears desirable to publish tracings of the photographic curves.

As proposed in the last Report, tracings of the photographic curves of magnetic movements and earth-currents, reproduced by photo-lithography on a reduced scale, have been given in the volume of "Greenwich Observations," 1882, for 34 days of greater or less disturbance, in substitution for the tables of ordinates measured from the photographic trace. Besides these, a brief description of all magnetic movements (superposed on the ordinary diurnal inequality) has been given for other days with a view of affording facilities for comparing them with solar phenomena. In the preparation of these particulars, as well as of the plates, Mr. Ellis has rendered very valuable assistance.

The meteorological instruments and the Thomson electrometer have been maintained in good order. In the gale of Jan. 23 the short connecting chain attached to the pressure plate of Osler's anemometer gave way, having perished in course of many years' exposure to the weather. After some delay through our having to wait for a quiet day before the pressure plate could be examined, a new chain was substituted on Feb. 26. The flexible brass chain connecting the external chain with the recording pencil continues to give very satisfactory results.

A new photographic thermometer apparatus, in which I have arranged that the dry and wet bulb traces shall fall on the same part of the photographic cylinder as regards time-scale, is being made by Messrs. Negretti and Zambra, and, after many delays, is now nearly finished. By means of a long air-bubble in the wet-bulb thermometer, with a column of mercury above, the degrees and decades of degrees are registered for this thermometer just below the trace of the dry-bulb thermometer, and without any interference of the two records. The scale of time for the thermometers will in this arrangement be the same as for all the other registers, both magnetical and meteorological.

A slight shift has been made in the positions of the rain gauges in the magnetic ground.

The observations of the temperature of the Thames made at the Deptford Cattle Market are regularly communicated to the Royal Observatory, and appear to be quite satisfactory.

The meteorological reductions are in the following state:—The observations of barometer, thermometers, anemometers, rain-gauges, and sunshine instrument (corrected, where necessary, for instrumental error), are reduced up to the present time. On the photographic sheets all the time-scales are laid down to the end of 1883. The hourly ordinates are read out for the barometer to 1883 February, for the dry-bulb thermometer to 1883 July, for the wet-bulb to the end of 1882 only, and for the electrometer to 1883 June. Commencing with the year 1882, the electrometer results have been drawn up so as to exhibit the mean diurnal inequality in each month for rainy days and for non-rainy days, as well as for all days taken together.

Notes.

The *Hotel Sahara* at the Biskra Oasis is shown in our supplement this week. In the account of his trip, Mr. Pritchard told how the journey over the desert terminated here, and how the French colonists have not failed to provide some of the characteristic features of Parisian life, even though this green spot, bounded by an ocean of sand, is but two miles long and half a mile wide.

Strolling, recently, on one of the South London Commons much frequented by the itinerant photographer, we spied one of the fraternity with an enormous carriage-umbrella under his arm. Our curiosity was stimulated, and we watched his proceedings. He was not long before he caught a sitter, and while he focussed and exposed the plate, his assistant held the umbrella over the sitter. "I wouldn't be without that umbrella for anything," said he to us afterwards. "Why, I can take 'em in the open sunshine, and get a nice shade over the face, and they come out with the

eyes fust-class." This was very likely, but the *tout ensemble*—the simpering sitter, and the anxious assistant shielding her almost lovingly with the umbrella—made an extremely funny picture, quite worthy of the detective camera.

The important subject of photo-lithography in half-tone will be treated of by Major Waterhouse in some of his future articles; and in these chapters our readers will find much that is novel, also a great deal that has been almost forgotten.

An etching process on copper for the reproduction of half-tone, like that of Klic (present number, page 477), is very much more rapid than an electrotyping method like that of Waterhouse; but we hear that Major Waterhouse is now working with an etching method which offers interesting points of novelty. Our readers shall have particulars before long.

Which is the more rapid, the wet process, or the dry? If one only considers the time of exposure, there can be but one answer to the question; but if exposure and development are taken together, the case is altogether different.

Hence it is that those who have to photograph a series of inanimate objects—as, for example, drawings and other subjects for reproduction by photo-mechanical methods—almost invariably prefer to use wet collodion. "I can do three times as much work by the wet process, and it costs me less," said a photographer who does little else than copying and making negatives from the inanimate.

The competition having reference to the novel posing of photographic "sitters," to which we lately referred, has duly come off, and the results are even more disappointing than we expected they would be. There are innumerable suggestions made, it is true, but most of those which are new are not practicable, whilst those which are most practicable are certainly not new. One wag suggests that the most novel position which a "professional beauty" could assume would be "to be taken with her husband"; and two or three competitors propose that to avoid all danger of artificial expression, it would be advisable for sitters to be taken asleep!

Several correspondents think that ladies with shapely arms in search of novelty would do well to be taken in a coquettish cap and bibbed apron, making a pudding; an alternative occupation suggested being the much more poetical one of picking roses growing well nigh out of reach. That people should be taken blowing bubbles, playing cards, swinging in hammocks, skating, playing at "bob cherry," bicycling or tricycling, stepping in and out of carriages, doing fancy work, threading needles, darning stockings, playing the piano, rocking cradles, picnicking, feeding fowls, and riding "property" horses. Here we have but a selection of the suggestions, more or less anticipated, which are forthcoming.

One competitor, however, thinks he has hit upon a good notion in saying that a sitter should have a back view as well as a front one taken, and that the resulting pictures should be stuck on either side of the card mount. These portraits would, like medals, have their obverse side. Another proposes that the pose and attitude of the sitters in well-known paintings should be imitated; whilst a third, evidently "a funny dog," thinks it would be effective for photographic "subjects to be posed in attitudes identical with those of our best known London statues. Only fancy being taken in a carte *à la* "Griffin," or in a cabinet *à la* "Queen Anne in St. Paul's Churchyard!"

By one original genius, photographers are advised to provide themselves with a huge practicable "Jack-in-the-box" kind of arrangement, and to "take" their "sitters" "coming out" of that! Yet another proposal is that during a hot summer a "property" bathing machine would form a good background, and that photographs in bathing costumes might become quite the fashion. The suggestion that portraits should be taken in relief as medallions, and worked up in the shape of porcelain or terra-cotta plaques, has to a great extent been anticipated; in fact, as we have said, there is little in the competition which can be considered practically useful, and it will be curious to note which of the suggestions is considered worth the two guineas offered as a prize.

Immediately in front of the National Gallery, a galvanized iron building, about thirty feet long, and surrounded with a galvanized iron fence, may be seen; and this turns out to be a studio in which some of the pictures are to be photographed. We are glad to have photographs taken of the pictures, but how easy to have done this work without putting up a studio of the very ugliest type, and in such a position as to disfigure the finest open square in the metropolis. Perhaps the authorities are of opinion that Mr. Williams' pepper-castored building is already so hideous, it can scarcely be made worse.

Apart from all questions of ugliness, the studio should be of a kind suited for photographing paintings, not a portrait studio of the worst type; and it should have been placed in a proper position as regards the light—quite an easy matter if the work were done on the roof as formerly.

The *Daily News* exults much at the prospect of the pictures being photographed "*with the advantages of a proper position and a good light.*"

Mr. Spiller informs us that there is some probability of the paper-makers acting on his recommendation to use sulphite of soda as an antichlor instead of the hypo-sulphite; and his recent paper, "Observations on Fading," has been reprinted in the *Stationery Trades Journal*. It is a very good thing for the matter to be ventilated in the paper trade circles; but a few successful actions for damages against those who supply faulty mounts or paper will be the best means of bringing about so desirable a change.

When goods are supplied for a definite purpose, there is held to be an implied guarantee that they contain no substance which is *well known* to unfit them for that purpose; and that, as regards the intended use, there is no latent defect which might have been avoided by reasonable care in the manufacture.

A photographer who purchases mounts which cause his pictures to fade, owing to the presence of hyposulphite, may recover full damages for loss of trade and reputation, provided that the mounts were bought of a firm accustomed to supply mounts to the photographic profession, and that the vendors had reasonable ground for knowing to what use the mounts were to be applied.

Similarly, a photographer may doubtless recover consequential damages from the maker of defective dry plates, provided he can prove his case.

The celebrated suit of Turner *v.* Ermen illustrates the law of implied guarantee. Cotton thread was supplied to Turner, a manufacturer of elastic webbing; and as this cotton contained a trace of fatty matter—well known to be injurious to rubber—the plaintiff gained his case.

The fear of being taken for a dynamiter on the one hand, and of having his plates spoiled by anti-choleraic fumigatious on the other hand, may perhaps have influenced a holiday maker or so not to take the camera to the Continent this summer.

Any readers who may have thought of leaving their cameras behind may reassure themselves, as the dynamite scare is practically confined to our own shores; and it is quite easy to avoid frontier stations where fumigation is the order of the day.

If plates are done up in light-tight packages of four, and each three of these packages is wrapped in a sheet of tinfoil, the tourist need not fear, as on all principal routes the Custom officers are quite used to photographers and their belongings.

Only once has our statement as to the nature of a dry-plate package been questioned, and this was in passing alone and on foot from Switzerland to Italy, at the village of St. Remy.

We took out our candle, lighted it, put the red shade in position, and said the plates must be examined by this light, if at all. Curiosity, rather than a desire to search after contraband articles, was the motive that led the soldier to fit up a dark-room, and to watch us as we emptied our slides and re-charged them. Half-an-hour afterwards three Italian soldiers and an Englishman might have been seen smoking and chatting outside the village inn, *Hotel des Alpes Pennines*, this establishment being conveniently situated nearly opposite the Custom House.

After the recent inspection of the Yeomen of the Guard in the garden of St. James's Palace, as they were standing drawn up in line in their picturesque Henry VIII. uniforms, an equerry arrived suddenly on the scene with a message from the Queen for the commanding officer. Her Majesty had, it seemed, given orders for the corps to be specially photographed for her, and accordingly several successful negatives were soon after taken, and the results have since been submitted to and approved by the Queen. If Her Majesty would permit these photographs of her faithful Beefeaters to be published, they would doubtless prove popular.

Photography as a means of verification has many applications, and we see that the proprietor of an advertising circular has hit on a new one. He proves that he has posted the six thousand copies he agreed to post, by a phototype reproduction of the official receipt for the postage of the six thousand copies of No. 1 of his circular, posted in bulk and without stamps.

The nation cannot complain of the cost of photography to the State. As we mentioned a month ago, the total amount spent last year was £2,620, and of this science and art absorbed £1,000 for photographing of art objects and the reproduction of pictures; £760 went to the Photographic Department at Woolwich Arsenal, and £860 was spent in reproducing the unlovely faces of our criminals at the various gaols in the three Kingdoms.

That photographic curiosity in journalism, the *Nutshell*, is a curiosity no longer. It may be presumed that either the photographing of each page was unworkable, or the smallness of the reproduced type a drawback, since the paper now appears in the conventional form, and a little larger in size.

The solution of amber in chloroform, occasionally used by photographers as a varnish, finds a new application in giving lustre, weight, and pliability to silk goods. The solution having been applied with a sponge, the materials are heated in a dry box, which is so arranged that the chloroform can be condensed and recovered.

Seven thousand patents were applied for during the first four months of this year, and of these only four were refused. The largest number applied for on any one day was on the 1st of January, when 266 applications were made; but on the 2nd of April only 40 persons wanted to patent.

Some of the photographs of Venus taking during the transit of 1882 show elevations of surface which MM. Grye and Arago seem inclined to attribute to a large continental plateau, or to some kind of cloudy matter; possibly a combination of both.

It will not be forgotten that photographic measurements of Venus have indicated a Polar flattening of about $\frac{1}{3}\frac{1}{0}\frac{1}{3}$rd,

this being not very different from that of the earth. As regards the projections recently put on record by the camera, it may be mentioned that their position is such as to confirm the observations made sixteen years ago by Trouvelot.

Patent Intelligence.

Applications for Letters Patent.

10,226. BENJAMIN JOSEPH EDWARDS, 6, The Grove, Hackney, Middlesex, Photographer, for "Improved apparatus for dissolving and changing pictures in the magic-lantern."—(Complete Specification.)—Dated 16th July, 1884.

10,334. JAMES STURROCK, Bank Street, Dundee, Forfarshire, for "Improvements in washing baths for photographic purposes."—Dated 19th July, 1884.

10,370. CHARLES STORTZ, 33, Bonchurch Road, Hassocks Gate, Sussex, Photographic Printer, for "An improvement in washing apparatus for photographic negatives."—Dated 19th July, 1884.

Patents Granted in America.

301,706. THOMAS D. FITZSIMMONS, Philadelphia, Pa., assignor of one-half to Robert W. Witham, same place. "Process of preparing canvas for photographing." Filed February 20th, 1884. (No specimens).

Claim.—1. The herein-described process of preparing canvas and similar material, so that a photograph may be taken thereon, consisting of coating the surface of the canvas with ordinary paint mixed with megilp, varnish, or a similar material, and afterward covering the painted surface with collodiou, and submitting the prepared surface to a bath of nitrate of silver solution, substantially as shown and described.

2. The herein-described process of photographing upon canvas and similar materials, consisting of painting the surface of the canvas with a mixture of ordinary paint and megilp, or varnish, coating with collodion, then submitting it to a bath of nitrate of silver solution, afterward placing the prepared canvas in position in front of a camera having a negative of the picture to be taken placed in the back part thereof, said camera being placed in front of a window in a room from which the light has been excluded, except as it strikes the lens of the camera after passing through the aforesaid negative, substantially as described.

EOSINE.

BY CH. EHRMANN.

EOSINE is not, as erroneously believed by many, an aniline colour, but is a dye-stuff, belonging to the series of phtaleïns, which are compounded in various forms by synthesis.

Diphenylphtaleid, $C_{20}H_{14}O_2 = C_6H_4C\ (C_6H_5)_2$, C_6O, is the substance from which other phtaleïns are derived, and is formed when chloride of aluminium is gradually added to a mixture of four parts of benzole and one part of phtallyl chloride.

When resorcin, which is made by the melting of galbanum, ammoniacum, asafœtida, &c., with caustic potash, is heated with anhydrous phtallic acid, a red precipitate occurs, which is quite insoluble in water, and the solutions of which in alkalies show remarkable fluorescing qualities. Sufficiently diluted, such solutions appear yellowish-red by transmitted, and yellowish-green by reflected light. This matter is called fluoresceïn. When its solution in glacial acetic acid is subjected to the action of bromine, there is formed tetra-bromo-fluoresceïn ($C_{20}H_8Br_4O_5$), a yellowish-brown powder, crystallizable from alcoholic solutions. Its soluble potassa salt ($C_{20}H_6K_2Br_4O_5$) has been termed eosine. It is fluorescing, and colours silk a beautiful pink. Tetra-bromo fluoresceïn, tetro-iodo-fluoresceïn, and auother stuff of blue colour, cyanosin (of which but little is known), are substances which now, on account of Vogel's great invention, will occupy the minds of all studious and progressive photographers.

The chemistry of the phtaleïns, like that of many other organic compounds, is difficult to learn, and far beyond the knowledge of chemistry possessed by photographers generally. Nevertheless, it is interesting to know something of the matter we employ or expect soon to use daily. Pyrogallol, hydrokinone, and pyrocatechin, treated with sulphuric acid, or anhydrous phtallic acid, give substances similar to fluoresceïn as obtained from resorcin.

Dr. Vogel, as we learn from foreign communications, has resumed his labours, commenced about eleven years ago. Others have worked in the same direction, and it is fair to say that a magnificent result is the consequence of Vogel's investigations. With proper application of those colour-stuffs, either to collodion or gelatine emulsion, colours can now be reproduced photographically in the same proportion of value that the human eye sees them. The dark blue and the light yellow can now be photographed dark and light—not light and dark, as heretofore

When knowledge of these great inventions reached our shores I, probably with many others, commenced to make experiments in their direction, and although I have not met with the success wished for, I have become acquainted with some interesting facts, which may also be interesting, possibly instructive, to others. Dr. Vogel's process having only recently come to us, was not known to me at the time in all its details as described in the latest number of foreign journals. With collodion I progressed but poorly, and as I cared more for the working with gelatine plates, I devoted my attention to Tailfer and Clayton's patented isochromatic process.

The first and possibly the greatest difficulty was to procure the right sort of eosine. I obtained at last three different samples—a light yellow, a light ruby, and a dark red. By mixing the two first in the proportion of 1 : 2, I had what I thought would do, and commencing operations, I took of the

Mixed colours	5	grams
Water	120	c.c.m.
Ammonia (stronger)	30	,,
Alcohol	50	,,

dissolved and well mixed.

I used bromo-iodide gelatine plates (5 per cent. iodide). I washed the plates first in water till it ran smoothly over the plate, and immersed them for one minute in the eosine solution and washed again, till the water dripping from the plate was quite colourless, and dried them in an ordinary drying-box. The plates were of deep orange colour. My first pictures were the most encouraging. I copied two highly coloured chromos in which yellow, orange, and blue predominated. Of several developers used I found pyro, soda, and sulphite to be the best, and I actually obtained a reproduction in which the value of colours is perfectly well represented. With dark blue and light orange silk ribbons I did not succeed as well, although the yellow showed much lighter than on an ordinary collodion plate. With a dark purplish blue lily and some yellow buttercups, I made a decided failure. I have tried one portrait (face red and much tanned). Result: over-exposure, but showing the desired qualities. No success with collodion. With the portrait, I gave two seconds more than usual. Without it, the negative might have been better. Dr. Vogel's formula just having arrived, I have not had a chance to try it. I doubt whether the colours used were really those he described. Through the kindness of Dr. Vogel, I will soon be able to work with the same colours as he uses himself. When I have them, I will resume my experiments, and let you know the results.—*New York Photographic Times.*

PHOTOGRAPHY FOR LADY AMATEURS.

BY F. J. ERSKINE.

FOR many years photography was a sealed book to any but those of wealth and leisure, or making it their profession. A donkey-load of apparatus and some most fearfully poisonous ingredients were required. The baths left ineffaceable stains on the fingers; the whole apparatus was cumbersome, heavy, and costly.

Makers of photographic appliances are now making up tourist sets of quarter-plate size, and more expensive ones to take half-plates. A whole set, with camera, tripod, three double dark backs, each holding two dry plates, chemicals, and all requisites, can be obtained from £4 4s.

Many will say, however, that a properly-fitted dark room is necessary; but although, if possible, it is best to requisition a dark cupboard or attic for a "den," it is by no means indispensable. When away from home, a ruby glass lantern should be carried, and light may be effectually excluded from the plates by developing at night the negatives taken during the day. If a lamp or the moonlight comes through a window, a sheet of brown

paper pinned across with drawing-pins will effectually make all sure. Apparatus required:—Three or four developing-trays of ebonite, one being legibly marked "hypo;" a bottle of pyrogallic acid, a small drop bottle for containing the ammonia bromide solution, a jar containing hyposulphite of soda for "fixing," a couple of graduated glass measures for fluids, a box of scales and weights, some bromide of potassium (useful in case of over-exposure), a small package of alum to clear and harden the gelatine film, and a nest of three developing-cups.

A certain amount of care is requisite in the use of the dark slides. Each should have its own separate case of black American cloth, fastening with buttons, and when taken out of the case it should be covered with the focussing cloth. More caution is required in the brilliant days of summer than at other times. Some people say that the sun is not as bright now as some time ago. All I know is that, if dark slides are carelessly exposed to the summer rays, the plates run a very good chance of being fogged, and it is very aggravating, when pains have been taken to get a good view, when developing to find out all the trouble has been wasted on a fogged plate.

It need not be taken for granted that, because a person cannot draw, she is deficient in artistic feeling. Most people can pick out a pretty "bit" to photograph.

The weather which is best for photography is when there are gleams of sunshine, with plenty of clouds about to give the requisite soft variation of light and shade. A cloudless sky and a hot sun are not good. A photograph should never be attempted with the sun shining on the lens, as fogging is certain to ensue. Many beginners spoil their plates more by under-exposure than by over. Hearing of instantaneous photography of races, Flying Scotchmen, and other miracles of rapidity, they must needs give their unfortunate plates so short a time that no image can be impressed.

In the first place, the plates must be put in the slides. It is as well to decide how many photos to take, and not have more plates out of the boxes than are absolutely necessary. The slides are parted by divisions of blackened metal. A plate is first laid prepared side downwards, the metal division put in with the spring piece uppermost. Then another plate with the prepared side facing the operator, two tiny clips are pushed forward to hold the plates down, the shutters are closed, and all is ready. N.B.—Of course this must be done by ruby light.

I may here give a practical hint.

Write, stencil, or otherwise mark the shutters A, B, C, &c. The object of this is to avoid exposing the same plate twice. I went one day to photograph the inmates of an incurable home, and, after the general amount of putting in a good light and stacking the patients who were movable on the steps, I got them quiet and exposed my plate. After this I got the superintendent and the home cat, posed them prettily, took off my lens cap, and went home rejoicing.

I developed, out came faces black and well; but a most singular muddle was apparent, even by the dim light of my red lantern. As soon as safe I examined by naked light. Horrors! The cat's tail was meandering over a couple of the patients' faces. The garden seat and brick wall were in apparently mid-air, and a general confusion was visible. Since then I always mark the slides, and would advise others to do the same.

A tourist camera is generally on the "bellows" and "folding-type" system, so as to be compact. In some, provision is made so that the lens screws in either way, thus saving a separate package. The travelling stands are composed of ringed detachable sticks, three in number, which joint on to a triangular top. The camera is attached by a small thumbscrew.

Lightness has to be considered; but this very lightness is an intolerable annoyance if there be much wind. It is to be hoped that some more steady arrangement may ere long be introduced.

The focussing cloth is generally of either black alpaca or velvet; velvet, being more opaque, is much the best.

To take a photograph in the field or open country the apparatus requisite is generally held in a wallet or satchel, comprising camera, stops, two double dark backs, or three, tripod top, thumbscrew, and focussing cloth. The total weight may be 5lb. The legs of the tripod are carried separately. Arrived at the place of operations, fit the stand together, unfold and adjust the lens of the camera, connect the two by the thumbscrew, and the camera is all right. Focussing is done either with a screw adjustment and winch handle, or slackening the screw belonging to the sliding side of the camera. The screw adjustment is about 15s. extra. Sliding adjustment is nearly as good. The lens-cap must be taken off and the ground-glass screen secured by its clip. This screen occupies the same space as the plate does when the shutter is raised; so the carefully focussed image thus falls exactly on the plate. If indistinctness is observable by the edges, a stop inserted will condense the light, and although it will darken the picture a little, will give the requisite sharpness. No picture should be taken without a stop. In most lenses revolving stops are inserted; this is a great advantage, as divided stops are very easy to lose. The images being clear and well defined, the glass screen is turned back on its hinges, and the dark-slide inserted, being carefully covered with the focussing cloth. The lens cap is in position. If a sunny day with light clouds, wait until a cloud passes over the sun. If windy, and there are trees about, wait for a quiet moment. Carefully draw up the slide, uncap the lens, letting hand and lens-cap fall down. Give from two to five seconds (counted), cap the lens, shut down the slide, and, after noticing the distinctive mark, repeat process as many times as you have plates.

To develop, go to the dark room. Light the ruby lamp. Carefully exclude all white light, and place the plate in a tray of water (plain hard water will do) to swell the gelatine and render it more easy to develop free from spots. Measure out three grains of pyrogallic acid and dissolve in one ounce of water. Place this in one developing-cup. Drop into another three drops of the ammonia and bromide solution from the drop bottle, take out the plate carefully, and put into another tray. Pour the pyrogallic solution over with a kind of swinging motion, so that it covers the plate entirely. Pour the solution from the tray into the cup containing the ammonia bromide and bromide solution, then, with the same "swinging" motion, return the mixed contents upon the plate.

If the exposure has been of the right duration, the picture in a few seconds will begin to appear. Black lines and patches will appear, and in a few seconds the details will be out. In a negative everything white is black. If a landscape is taken, the sky will be black, and the trees and houses white and grey black. When all detail is fully out, which may be known by looking at the back of the plate, if a faint representation of the picture is visible, the plate must be washed—either douched from a jug or held under a tap for a few minutes. It should then be placed in a strong solution of alum and water for five minutes, then rinsed and dropped into a fixing bath of freshly-made hyposulphite of soda (about a dessert-spoonful of hypo to a pint of water). Hypo, as it is technically called, dissolves out all the sensitive ingredients remaining unacted upon, and renders the negative impervious to light. It may now be well washed, and examined in daylight. All the lights, it will be seen, are reversed, the deepest shadows being plain, white, clear glass.

The ammonia and bromide solution mentioned above consists of—

Bromide of potassium...	2 drachms
Water	4 ounces
Strong liquid ammonia	2 „

This must be kept in a glass-stoppered drop-bottle. Above all things, keep dishes, cups, and all utensils perfectly and thoroughly clean—never grudge water. The best books on photography are not very expensive. Capt. Abney's "Instruction in Photography" is invaluable.

Photography is not difficult. It requires care and study, and cannot be done off-hand any more than any other pursuit; but there is no sham about it, no copying and imitating. All is straightforward, and as a fascinating pursuit it has no equal.—*The Queen.*

ECHOES FROM THE ORIENT.

BY EDWARD L. WILSON.*

HOSPITALITY is exceedingly profuse on the part of the Arab, but no more so than the exactions which will be made of you for a "return present," or a return kindness, before you are permitted to bid him adieu and receive his blessing for the rest of your journey. But I believe this also was somewhat the way in the olden times, and perhaps this conservative people are not so much to blame. I have spoken several times of the way in which the women of the Desert carry upon their persons such property as they may have in the way of gold and silver and precious stones. Sometimes this seems to be carried to an extent that is hard to understand. We are taught to look upon this people as a poor people, having but little in this world; but

* Continued from page 551.

they do collect together from time to time some little property, and, inasmuch as they are liable to be turned away from their homes at any time, they practise carrying what they own about their persons. It is no new thing. If we ever go to the plain of Jezreel together, we will have brought to our minds the time when Gideon said unto his people, "I would desire a request of you, that you would give me every man the ear-rings of his prey." (For they had golden ear-rings, because they were Ishmaelites.) "And they answered, 'We will willingly give them.' And they spread a garment, and did cast therein every man the ear-rings of his prey. And the weight of the golden ear-rings that he requested was a thousand and seven hundred shekels of gold; besides ornaments, and collars, and purple raiment that was on the kings of Midian, and beside the chains that were about their camels' necks." (Judges viii. 24-27.) And so to-day we find these women oftentimes wearing ornaments of the precious metals upon their persons in considerable quantities, or, if they do not wear them, they carry them along. What we more than once noticed was this, that the Sheykh of the tribe with whom we settled at any time for our camels or for escort was exceedingly "human" on the gold and silver question. Our conferences with him were always secret. In making a bargain it was always agreed that first we should pay him a certain amount for himself, and then a certain amount further was to be paid which he would divide with the members of his tribe. It was very curious to see his humanity when paying him those sums, for with the greatest care and secrecy he would tie up his own portion in one corner of his garment, and then, after receiving a second sum, would either allow his *confrères* to come in our tent and receive their portion, or would go out to them and settle it. But if you ever travel in the Desert, do not delude yourself with the idea that a strict fulfilment of any bargain he may make will be received as final on the part of the Bedouin, even though you make the contract after the strictest form. He will expect you to make him a present of backsheesh in addition. Well do I remember to what extent we were expected to do this when leaving Petra and Akabah, and some other favourite resorts which we visited during our winter excursion.

I observed that our Bedouin attendants, as we crossed the desert, frequently ate no food from morning until night, and very rarely did they drink. They seem to have really but one meal per day, and that was at the evening time, after the travel of the day was over. Arriving at the camping-ground, certain ones would dispose themselves to the work of erecting their tents and making them ready for our occupation when we should arrive. The others would join together in clubs or "messes," as we used to do in the army, and, choosing the ground in the neighbourhood of the tents, make themselves a little semicircle by turning their camels' backs towards the ring. Then, placing the baggage against the camels, they would proceed to make their bread and coffee. Each man carried with him a little bag or package of barley flour. This flour was taken in fair proportion from each man, placed together, and made into a paste or kind of dough, then baked in a little rude oven made by digging a hole in the sand or gravel. The fuel was supplied by bits of Tufta bush, or brush and dried camel-dung, and thus the bread or paste was baked. When done, it was taken from the ashes, a measure of the dirt relieved from it by pounding or wiping on the skirts of the garment, and divided among the members of the club. This portion of the food, sometimes garnished with a bit of onion or some roots that had been pulled up on the route during the journey of the day, seemed to constitute all the means of food for twenty-four hours, unless it be division of a little coffee occasionally. It must not be thought, however, that we were compelled to live in this way. The genius of the tin-can and the inventor of the indispensable egg have guarded against any such miserable living as we have described as being the support of the Bedouin. In the morning we were served with coffee or tea and baked potatoes, and a chop or boiled egg, with perhaps some jam or preserved fruit. At noon-time we spread out our little lunch tent under the shadow of a rock or in the sun, as it happened to be, and were seated at a lunch of bread and cold chicken and jam, or dates, or oranges, with cold tea or lemonade, and eggs hard-boiled. The principal meal of the day, however, was at night, after our travel was ended. Then we had soup, one or two kinds of meat, vegetables, fruit, and oftentimes a pudding of one kind or another. We always carried live chickens and pigeons with us, and plenty of eggs. Sheep or lambs were always driven along with us. And when having used up our supply of them we purchased others on the way.

A word about the temperance principles of the Bedouin. They are Rhecabites—*strictly* temperate. I had to employ perhaps a hundred of them from time to time, and I met thousands of them. I never saw one of them either drink or drunk. And I am happy to say that our quartette made our whole tour without one drop of liquor or beer, drinking only the water of the country, as we found it from time to time, when our water skins were empty.

APPLICATIONS OF PHOTOGRAPHY IN SURGERY.

BY C. E. WEBSTER, M.D.*

SEVERAL years ago, an acquaintance, then studying dentistry, thought that he would try the experiment of taking a plaster cast of his arm. How was it to be done?

"It's easy enough," said a friend; "rest your arm flat on the table thus, and I will pour the plaster over it."

"But," said the dentist, "how shall I get my arm out of the mould?"

"Straighten it, and the plaster will break," was the reply; "and afterwards you can fit the pieces together and take the cast."

"Won't it stick to my arm?"

"I will prevent that by greasing it," said the accommodating friend.

So the brawny arm, well rubbed with olive oil, was laid with clenched fist and flexed elbow upon the table, and as the creamy plaster was being poured over its hairy surface, my acquaintance complacently reflected on what a striking object it would be as an ornament to his office, for it was a well-formed arm, and certainly in quite a striking attitude. His pleasant dreams awoke to sad reality when the plaster set, for not only was it impossible to straighten out the arm, and thus crack the mould, but after the hammer had been vigorously applied for that purpose it was found that each individual hair was so firmly embedded in its gypsum envelope that it would sooner leave the flesh than come out of the plaster. So, mid imprecations and blood, the fragments were removed. His pains were rewarded by a more complete success than had been anticipated, for, on fitting the parts of the mould and taking the cast, which was slightly tinted pink, it was discovered that the bulbs of the hair held more strongly to the cast than their tapering ends did to the mold, and the result was a life-like reproduction of the arm, ornamented with its own natural appendages.

The incident illustrates one of the many practical difficulties in the way of taking models of portions of the body, and suggests the desirability of other methods whenever possible. The difficulties can be overcome, and I have taken admirable casts of hairy parts without either shaving the hair or hurting the patient; still a good cast is not an easy thing to make. It tries a sick person greatly. It can't be done in a hurry, and requires skill and experience in the manipulation of plaster. Drawings are unreliable and hard to make. Outlines taken from shadows or with flexible metal strips are good as far as they go. But in photography we find a ready means of recording the outlines and surface features of a particular region or of the whole body with little trouble to ourselves, little expense, and no inconvenience to the patient.

We may consider its applications in surgery as a means of recording facts, of establishing diagnosis, and of assisting treatment.

In the progress of any science the accurate recording of the facts on which that science rests is of first importance. This record should be complete even to the most trivial detail, for it often occurs that what has at first appeared a minor point, shows itself to be on more extended research a constant characteristic. Photography records impartially that which is important and that which is thought to be trivial. It is particularly adapted for recording outlines, as in deformities of the limbs, the general appearance of solid parts, as tumors, dislocations or fractures, surface markings, as in diseases of the skin, and lastly, in those conditions that affect the personal appearance or attitudes of the patient, where description is impossible and the highest artistic skill necessary for truthful drawing.

It is unnecessary to enumerate the diseases that may be included under these headings.

There is probably no disease, some feature of which might not be better recorded for comparison and study by photography than by any other method. I may mention in illustration bow legs, cancers and other tumors, the varieties of eczema, and the

* Communicated to *Photography*.

facial expression in certain kinds of paralysis or varieties of insanity.

A diagnosis can best be reached in many slowly progressive diseases by a careful noting of the successive changes which occur in the early stages of the case. Thus in progressive muscular atrophy the changes are very gradual, affecting a few muscles, which, slowly wasting, finally leave depressions in place of their former prominences. Photographs taken at intervals in the early stage of the disease would much more accurately measure its progress than can be done by the eye, and render, in doubtful cases, the diagnosis much more positive. The art is also applicable to slowly progressive deformities, as in curvatures of the spine, where the comparison of photographs on the same scale would give the best possible means of estimating the changes taking place, and thus give valuable hints to the surgeon as to the best method of treatment.

The art is useful in the treatment of certain diseases. Thus in deformities where apparatus is necessary a good photograph may supplement or render unnecessary a plaster cast. I have found the following method useful. Photograph the patient in various positions with a scale of inches or centimeters in the field, thus enabling the mechanic, while constructing the apparatus, to measure directly from the picture the proportions of the various parts, rendering the subsequent fitting and adjustment quite a simple matter.

Photography can be used to deceive as well as to enlighten. I recollect two pictures representing a case of spinal curvature. In one the shadows are so arranged as to exaggerate the curve, and the body so turned that the tip of the farther shoulder-blade puts an extra point to the real deformity. In the other, which is to illustrate the benefits of treatment, all this is reversed. Strong lights obliterate minor features, and the position is such as to render the curves as inconspicuous as possible.

I trust that these hurried and incomplete notes may serve to call to the minds of physicians and photographers the advantage of their mutual relations. If a surgeon has sufficient need of it, an amateur outfit will be exceedingly useful; if not, he should make an arrangement with a photographer whereby the various valuable observations of his professional life shall not perish with his memory, but be preserved to form a part of that great common fund of knowledge which gives the staple foundation of our art.

Often an honest photograph is the best statement of a patient's case. Here we find the *chief* use of photography to medical science.

HOW TO EXPOSE A DRY PLATE.

BY S. L. PLATT.

The most convenient way to expose a dry plate is by using a small mirror, say three inches wide by five inches long. When a person is seated, draw the slide and get the position by looking in the mirror; continue watching the sitter during the exposure, and as he will not be conscious of your observation, you can tell when everything is right, and will find it unnecessary to develop your plates until the day's work is done. I have never found anything yet superior to the wet plate. Sometimes I still use them in preference to my own dry plates, and we are all apt to think ours are the best. Many things can be said in favour of both processes, but I believe they must always be friends. When I find a man all dry-plate, I set him down as having an axe of his own to grind, or as having but little experience in either. No honest man who fully understands dry plates will go back on an old friend, though it be a wet plate. I believe they must always stand side by side as being useful servants, and nowadays both are indispensable. For outdoor work or interiors, in making pictures of dogs, cats, horses, children, and other moving objects, the dry-plate is superior to the wet, undoubtedly; but for ordinary work in my hands I do not find it so.—*The Philadelphia Photographer.*

Correspondence.

ROYAL CORNWALL POLYTECHNIC SOCIETY'S EXHIBITION.

Dear Sir,—Allow me to remind intending exhibitors at the above exhibition that pictures for exhibition must arrive not later than August 5th, at the Polytechnic Hall, Falmouth.

I shall be most happy to supply forms of entry and prospectuses, which must be at once filled up.—I am, sir, yours faithfully, Wm. Brooks.

Laurel Villa, Wray Park, Reigate.

Proceedings of Societies.

The Photographic Society of Great Britain.

A meeting was held in the Committee Room attached to the Gallery, 5a, Pall Mall East, on Tuesday last, the 22nd inst., Mr. John Spiller, F.C.S., in the chair.

The Chairman referred to the new sunshine recorder recently made by Professor McLeod, but pointed out that several fairly efficient instruments are already in existence, as that of Campbell and the Whipple-Casella instrument (see our vol. for 1883, p. 509). McLeod's instrument depends on the reflection of the solar rays from a glass hemisphere silvered inside. The Chairman also alluded to the great value of prompt and accurate reports of the meetings of the Society.

Mr. Annan, of Glasgow, exhibited some photo-engravings done by the method of Klic, and it will be remembered that a specimen of work by the process in question (a portrait of Mungo Ponton) was issued with the Year-Book for 1882. An account of the method of making the plates will be found on page 67 of our present volume.

A copper plate is dusted with powdered asphalt, and the plate is heated, so that the asphalt becomes nearly melted. A negative carbon print is next transferred on to the copper plate, and the plate, now covered with the negative in carbon, is etched, at first by a strong solution of perchloride of iron, which penetrates only the thinnest parts of the picture; then by a weaker solution of the same salt, the solution etching through the thicker parts. By employing more and more diluted solutions, it is possible to etch through thicker and thicker layers of gelatine, so that only the high-lights remain unacted on.

The specimens exhibited by Mr. Annan comprised examples of work direct from negatives after nature, line work, and the reproduction of drawings in wash or tint. One of the copper plates was shown, but the depth of the *intaglio* appeared to be considerably less than is ordinarily the case with plates made by the method of Waterhouse.

Mr. Annan remarked that when long numbers are to be printed it becomes desirable to coat the surface of the plate with steel (method of Joubert).

The Chairman referred to the labour of Pretsch in producing *intaglio* plates, one of his engravings having been issued with the Journal of the Photographic Society in 1859.

Mr. Ashman gave the results of trials which he had made with several developers, and he spoke very highly of the sulphite of soda developer, recommended by Monroe, no restraining bromide being required. It is prepared as follows:—

Solution No. 1.

Sulphite of soda	4 ounces
Water	11 „
Sulphurous acid, enough to make the solution slightly acid	
Pyrogallic acid	1 ounce

Solution No. 2.

Carbonate of soda	3½ ounces
Sulphite of soda	6 drachms
Water	64 ounces

To develop a normal plate, one drachm of No. 1 is mixed with one ounce of No. 2.

Mr. Ashman also obtained excellent results with the formic acid developer of Newton, this being made up as follows:—

No. 1.

Carbonate of soda (dried washing soda)	3 ounces
Carbonate of potash	3 „
Sulphite of soda	3 „
Water	40 „

No. 2.

Pyrogallic acid	48 grains
Water	12 ounces
Formic acid	12 minims

In ordinary cases, ½-oz. of No. 1 is mixed with 1 ounce of No. 2, and ¾-ounce of water.

Mr. Sebastian Davis asked whether any members had experience with the water-glass substratum for emulsion work (see Formulary.)

Mr. Cowan pointed out that not only does the use of such a substratum cause the film to adhere to the glass, but it makes the emulsion flow over the plate almost as readily as collodion.

Newcastle-on-Tyne and Northern Counties' Photographic Association.

The third of the current year's series of out-door meetings of this Society was held last Saturday afternoou at Dilston, near Corbridge-on-Tyne. The ruined hall at this romantic spot was formerly one of the residences of the ill-fated Earl of Derwentwater, and it, together with its surrounding picturesque scenery of wood and water, has oftentimes formed a happy subject for artists of all kinds—the wielders of pen, pencil, brush, and photographic lens alike. Mr. E. Goold, of Elswick Lodge, Newcastle, was the leader of the expedition ; and under a propitious sun and sky, a fair number of plates were exposed, and have since turned out satisfactorily.

Mr. J. P. Gibson, of Hexham, with characteristic hospitality, entertained the members to a substantial tea, and afterwards showed them through his large studio of photographic views, which for variety and good workmanship are equally admirable. Altogether the gathering was most agreeable ; the next will be held at Bywell on Wednesday, August 6th, under the leadership of Mr. E. Dodds, of Low Fell, Gateshead.

London and Provincial Photographic Association.

A meeting of this Society was held ou Thursday, the 17th inst., Mr. A. Cowan in the chair.

Mr. J. H. Hare exhibited Messrs. H. and E. Dale's electric chronograph, which is an ordinary clock movement attached to a dial some fifteen inches in diameter, the circumference of which is divided into sixty sections, which require one minute to traverse ; this chronograph is in electrical connection with a shutter made on the principle of Mr. Cowau's double drop. Upon establishing electric continuity by means of a press button, an index hand is thrown into gear, and starts contemporaneously with the fall of the first shutter, which uncovers the lens ; when sufficient exposure has been given the button is released, the second shutter theu falls, covering the lens ; the hand, being thrown out of gear, returns to zero.

Mr. W. M. Ayres passed rouud a number of 12 by 10 silver prints from negatives recently taken iu the north of Scotland ; these comprised subjects of varied character, such as interiors, exteriors, marine, and floral, some of which were very fine. In response to a request by the Chairman, he showed his method of cutting circles in ebonite, hard wood, and like substances ; the peculiarity consisted in fluting the cutting tool which he employed in a wimble.

Mr. Sutton showed some negatives which had been entirely spoilt by beetles eating the gelatine whilst drying.

Mr. W. M. Ashman, speaking on silver prints changing in the light, more if burnished than if simply rolled, showed four prints which were burnished in April last : two had been exposed out of doors in the interval, the corresponding pair having beeu stored in a dark room. Those exposed to the light had changed from a rich purple to a brick red colour, but had not otherwise faded.

Mr. W. K. Burton preferred the changed colour. He remembered seeing prints of a similar colour in Ediuburgh which he was much pleased with ; upon euquiry for the toning formula he learned that the priuts had beeu exposed a long time to the sunlight.

Mr. A. Mackie had found prints which were not burnished turned much bluer by keeping when not exposed to light.

The Chairman thought damp had more to do with prints changing colour than anything else, and instanced specimen show-cases at railway stations ; one, he remembered, situated under a leaky water-pipe which had been overlooked, was in a most dejected condition.

The subject of printing on opal coated with gelatine chloride emulsion was next discussed, and Mr. H. E. Moule mentioned that an excess of silver was absolutely necessary if purple tones were desired, otherwise no reasonable amount of toning would give a good colour ; the drawback to using an excess of silver was found in the plates not keeping beyond a few days.

The Chairman found no difficulty in keeping chloride plates (washed) such as he used for transparencies, and thought the tarnishing of the free silver would be arrested if the plates were re-coated with a suitable substance : gelatine had been suggested for the purpose.

The Secretary thought the result shown at the last meeting gave great promise ; he would endeavour to obtain the formula for publication shortly.

A Member said good results could be obtained with the following :—

Gelatine	160 grains	in 3½ ounces	of water
Nitrate of silver ...	150 „	1 ounce	„
Chloride of sodium	40 „	1	„
Citrate of potassium	40 „		„

Mix, boil five minutes, set, wash, re-melt, coat, &c.

St. Helen's Association of Science, Literature, and Art.

Photographic Section.

A meeting of this section was held on the 25th ult., Mr. Heather in the chair.

Mr. Tees presented the section with an illuminated copy of the rules. A cordial vote of thanks was accorded to Mr. Tees for his present.

Mr. Brook showed about a dozen negatives of views taken at Lynn ; three of these, which should have been the best, were fogged. An inquisitive young lady at the above place had opened the slides to see the "pictures" whilst Mr. Brook was in the next room. Mr. Brook will lock the bag in future. The rest were very good, including two negatives of three St. Helen's celebrities, viz., the most corpulent men in town, total weight 980 pounds.

The Chairman described a number of experiments he had been making with boiled and cold emulsions ; he was not very successful with cold emulsions, and was now more than ever a disciple of the boiling process.

After the inspection of a number of prints and chemical photographs (not by Mr. Sherlock's new process), the meeting adjourned.

Talk in the Studio.

The International Exhibition at the Crystal Palace.—From the report of the awards in the Fine Art Section, we learn that a Silver Medal has been awarded to Mr. Horatio Nelson King for his photographs. The award made to Mr. King is, we believe, the only one made for photography.

Curious Case.—At the Liverpool County Court, before Mr. T. E. P. Thompson, judge, Mr. A. Vandyke, photographer, Liverpool, sued Mr. Geary, of Birkdale, to recover £3 3s., the agreed charges for an opal enlargement of the figure of a lady made from a glass picture at the defendant's request. Mr. H. F. Neale, who appeared for the plaintiff, stated that the picture was well executed, but the defendant rested his contention of the claim upon the fact that no proof had been supplied to him. Correspondence was then read in which the defendant alleged that he was dissatisfied with the picture, as he had bargained for a proof, and the plaintiff had agreed that he should not be bound to accept the finished portrait unless he (defendant) approved of it. Evidence having been given for the plaintiff, Mr. Broadbridge, who appeared for the defendant, in cross-examination of Mrs. Vandyke, elicited that she might have said the defendant was not bound to take the portrait unless it was satisfactory. Mr. Broadbridge then called the defendant, who said he objected to the picture because it seemed to show the lady represented as a sufferer from liver complaint, and there was a cadaverous expression about the face. Mrs. Vandyke said that he was not bound to accept it unless satisfied with it, and, being dissatisfied, he repudiated the contract. Mr. Neale contended that the fact of a proof not having been delivered was not an indispensable condition to the bargain, and that the mere crotchet of the defendant would not entitle him to succeed in the absence of evidence that the picture was not a good production. His Honour, in giving judgment for the defendant, said he was sorry for Mr. Vandyke, as he (the learned judge) was surprised that such an excellent picture could be produced from such a vague original ; but as Mrs. Vandyke had admitted that the bargain with the defendant was that he was not bound to

accept unless satisfied with the picture, he was reluctantly compelled to give judgment for the defendant, at the same time expressing an opinion that Mr. Van Dyke had been very badly used.—*Liverpool Post.*

Photographs of Coast Lines.—The German naval authorities have made arrangements for preparing a series of pictures of some of the more important coast lines as viewed from the sea, and it is easy to understand the considerable value of such a series to naval officers. The arrangements for the production of the series of photographs have been entrusted to Professor Vogel. The camera employed takes plates 16 by 4 inches, and a horizontal spring shutter is used behind the lens. In order to keep the camera in a horizontal position, a long rod and balance weight are used, the rod being attached to a hemisphere fastened to the bottom of the camera; and this hemisphere works freely in a corresponding depression in the top of the stand. Herr Schmid, who has been working with the apparatus at sea, reports very favourably of the arrangement.

Amateur Art Exhibitions.—*Cassell's Magazine* says :—"To make an exhibition successful, it stands to reason that the neighbourhood should be an artistic one, in order that there should be plenty of contributors. Next, it should be in a large and populous town, if possible at some distance from London, in order that there may be plenty of people to visit the exhibition, and to buy, if need be, when it is opened. Lastly, the exhibition should not be open for more than three days (unless the visitors continue to be very numerous, when it might be kept open an extra day or two), and the whole time the admission fee should be as low as possible. To make it pay its expenses, the secretary and the committee should do as far as possible all the office work, and the unpacking and packing of the works for exhibition. But expense should not be spared, in the first instance, in making the exhibition well known by means of notices in the papers, &c. A fault, which it may be well to mention, is the absurd prices amateurs are apt to place upon their works, pricing them at a fictitious value, and all the time they appear to be confident that their work will sell ; whereas, if the object is to dispose of the work, an artist should be content with a fair rate of profit—at any rate, at first." Among these suggestions organisers of local photographic exhibitions may possibly be able to gather an idea or so ; at any rate, some points for consideration.

Rendering Paper Waterproof.—Labels may be fixed upon tin boxes, &c., exposed to damp by the following method : White of egg is diluted with one half part of water, and applied with a brush to the surfaces to be united. A hot iron is then passed over the paper, so as to coagulate the albumen. By means of successive layers of paper and albumen, waterproof boxes, &c., may be formed.—*Cosmos.*

The New Silver Country in Australia.—New South Wales can boast the possession of one of the newest silver-producing districts in the world. It is situated in what are designated the Barrier Ranges, near where the Colony joins South Australia, but is at present extremely difficult to reach in consequence of the absence of ordinary travelling accommodation, though the road is described as being much better than the average Australian bush track. The country through which the coach passes is purely a saltbush one, and in dry weather natural feed for cattle is scarce. The existence of silver-bearing ores in the district was first discovered by a shepherd in the year 1876, whilst out with his mob of sheep on the range. He brought samples of the ore to some of the local magnates, but as their nature was little understood, the treasure lay undisturbed until a Mr. Green raised some of it with the intention of sending it to England ; through some mishap in transit no returns ever came to Mr. Green. About two years ago, however, another lot of ore was shipped to England to be sold, this time with better results, though through inexperience the miners selected the lowest grade ores, viz., argentiferous galena, leaving out the rich sulphides of silver. They netted the handsome return of £7 per ton on the shipment, after the highest commissions and charges had been exacted. The second and larger group of mines is situated at a distance of 28 miles from Silverton. They are called the Lakes Camp group. The ores here are purely sulphides of silver, and very rich. Two tons of ore recently sent to England for assay were sold for £600. Shafts have been sunk in many parts of the ground held by the syndicate, and ore has been discovered everywhere, but, of course, all of it is not of the richest quality. The shafts vary in depth from 10 to 75 feet. In one put down, on a "big bonanza," the lode is found to be of enormous value (£300 per ton), and it is said that a great portion of the money paid by the syndicate for the entire ground has already been secured to them in profits from this one shaft. The lodes have all the appearance of permanency. In one shaft, the deepest of this group, the lode has been traced to the total depth, 75 feet, and at the bottom it is six inches thick, with indications of continuance and improvement. A great drawback to the rapid development of these mines is the scarcity of labour.

Two Hats.—An Englishman, who was recently having his photograph taken, desired to be represented sitting with his hat on, but the photographer insisted that he should occupy the stereotyped attitude sanctified by thousands of previous "subjects." When the photograph was sent home, the wife discovered that her husband had not only one hat on his head, but another on his knee.—*New York Daily Graphic.*

Photographic Club.—At the next meeting, on July 30th, the adjourned discussion on "The Effect of Coloured Media on Silver Prints" will take place. Saturday afternoon outing at Hampstead Heath, meeting afterwards at 6 o'clock at the Bull and Bush, North End, Hampstead.

To Correspondents.

*** We cannot undertake to return rejected communications.

Legal.—The fact of your not having registered them earlier is a complete bar, and we think that you have no remedy whatever.

E. Gould.—Thanks.

T. Coan.—1. It is very probable that they will be published in a separate form. 2. Thank you.

Amateur.—1. We will have a practical article on the subject shortly. 2. It is not sold commercially ; attach it to the lens tube by means of an elastic band.

W. Stannard—We do not know the address of the gentleman you mention ; but if we can ascertain it we will send it to you.

Thos. George.—1. See our volume for last year, page 221, for the best formula as regards the emulsion. We recommend the developer given on page 98 of the same volume. 2. Fairly good, but the back-ground is stained and spotty. Mr. Swan has patented such a machine, and a description has been given in our pages.

J. Tisett.—See leader in this week's News.

Miss Levere.—No process of the kind will enable a person who has not artistic power to do valuable work ; and the working of the so-called "process" is little else than a fraud. Money paid for instruction may be considered as quite thrown away, and the materials sold for the purpose are not worth more than one-fourth the price charged.

J. G. R.—This Correspondent complains that although he is, as a rule, successful in obtaining bright and vigorous negatives on commercial plates of a certain make, he has come to the conclusion that one batch was bad. He remarks: "I feel that it would be useless for me to write to the makers of the dry plates. They would be sure to reply that that the fault must be with me. Now I have honestly tried hard to find out if this were so, and I cannot detect a flaw. Makers of plates are but men, and are fallible, and I am beginning to suspect that the causes of want of 'sparkle' may lie with them quite as often as with us poor victims ; and I and many more, I am sure, will be grateful to you if you will push this revival of the old complaint against gelatine dry plates. If we are all duffers and cannot develop 'sparkle' in really good plates, why I, for one, shall be only too glad to know it and acknowledge the error of my ways ; but if there be no 'sparkle' in the plates to develop ; if we are paying a big price and good money—cash—for an inferior article, I think it would be well all round in the long run, to know that too." That defective plates are occasionally sent out by makers there can be no doubt ; although we believe that close competition has much improved the general character of plates of late. When a person who ordinarily obtains satisfactory results has plates which he considers bad, the best way is to go to the maker and request him to produce a satisfactory negative on one of them. Should he refuse, some of the plates might be taken to another photographer for trial, or, perhaps, to two reliable photographers, and in the event of an unfavourable report a claim might fairly be made upon the maker of the plates.

A. J. Hilder.—We cannot give a very decided opinion, but it seems probable that they arise from dust settling on the films, and locally reducing the sensitiveness. This may have been while the plates were drying.

G. P. Cartland.—It is very good of you to send us the photographs. Thanks.

Studio.—Ammonia will not remove it, but it dissolves readily enough in dilute acids—one part of hydrochloric acid and six parts of water being as convenient as anything for removing it.

C. RICHARDS.—1. Although it contains a very large proportion of sulphur, it is very doubtful whether it will exercise any injurious action; at least, we have used it in many cases, and have not noticed any mischief to follow. 2. Clean them by means of nitric acid, but take care to wash away any trace of the detergent before using them.

COLD.—You have overlooked the minus sign, —, before the figure, indicating the thermometric degree.

H. Z. G.—Either will do; indeed, there is little or nothing to choose between them; but we strongly recommend you to purchase it ready-made until you have gained some general experience in its use.

P. BRIGGS.—1. Your collodion must have been far too thick: dilute it with a mixturo of two parts of ether and one of alcohol. 2. It is very cheap, perhaps two pounds a ton if you purchase on a large scale; but in buying a few pounds, you must be prepared to pay sixpence or eightpence a pound. 3. It will answer very well, but plain white paper will answer better. 4. It rapidly absorbs oxygen from the air, and has probably become quite useless by this time.

NITRATE BATH.—1. Add enough carbonate of soda to make the solution just alkaline to litmus paper, expose to full sunlight for some days, filter, and make feebly acid with nitric acid. 2. See Captain Abney's "Photography with Emulsions."

WESTMINSTER.—Far too much has been added, as one-tenth of the quantity would have been sufficient.

The Every-day Formulary.

THE GELATINO-BROMIDE PROCESS.

Emulsion.—A—Nit. silver 100 grains, dist. water 2 oz. B—Bromide potassium 85 grains, Nelson's No. 1 gelatine 20 grains, dist. water 1½ oz., a one per cent. mixture of hydrochloric acid and water 50 minims. C—Iodide potassium 8 grains, dist. water ½ oz. D—Hard gelatine 120 grains, water several oz. When the gelatine is thoroughly soaked, let all possible water be poured off D. A and B are now heated to about 120° Fahr., after which B is gradually added to A with constant agitation; C is then added. Heat in water bath for half an hour, and stir in D. After washing add ½ oz. alcohol.

Pyro. Developer.—No. 1—Strong liq. ammonia 1½ oz., bromide potassium 240 grains, water 80 oz. No. 2—Pyro. 30 grains, water 10 oz. In case of an ordinary exposure mix equal vol.

Iron Developer.—Potassium oxalate sol. (1 and 4) 80 parts, ferrous sulphate sol. (1 and 4) 20 parts, dist. water 20 parts. To each 4 oz. of the mixed developer add from 5 to 30 drops ten per cent. sol. potassium bromide, and 30 drops sol. sodium hyposulphite (1 and 200).

Substratum or Preliminary Preparation.—Soluble silicate of soda 1 part, white of egg 5 parts, water 60 parts. Beat to froth and filter.

Fixing.—Sat. sol. of sod. hypo. 1 pint, sat. sol. of alum 2 pints, mixed.

Cowell's Clearing Solution.—Alum 1 part, citric acid 2 parts, water 10 parts. Edwards makes this sherry coloured with perchloride iron.

Eder's Method of Intensification.—The negative is whitened by soaking in sat. sol. of mercuric chloride, and after thorough rinsing immersed in potass. cyan. 10 parts, potass. iod. 5 parts, mercuric chloride 5 parts, water 2,000 parts. As film becomes dark brown, the actinic opacity is increased; but prolonged action causes brown tint to become lighter, until at last the negative is no denser than at first.

Fol's Backing Sheets.—A chromographic paste is prepared with gelatine 1 part, water 2 parts, glycerine 1 part, and a very small addition of Indian ink. Strong paper or shirting is coated, and the sheets are laid, ace downward, on waxed glass to set. Press to back of glass plate.

THE WET COLLODION PROCESS.

The Nitrate Bath.—Water 14 oz., nit. silver 1 oz., nitric acid 1 drop. Before using coat a small plate, and immerse it for 20 minutes.

Cleaning Preparation for New Plates.—Alcohol 4 oz., Jeweller's rouge ½-oz., liquid ammonia ½-oz.

Film-removing Pickle for Old Plates.—Water 1 pint, sulphuric acid 4 fluid oz., bichromate potassium 4 oz.

Negative Collodion for Iron Development.—Alcohol 1 pint, pyroxyline of suitable quality 250 grains, shake well and add ether 2 pints, *Iodize this by mixing with* one-third of its volume of alcohol ½ pint, iod. ammon. 80 grains, iod. cadm. 80 grains, brom. ammon. 40 grains.

Normal Iron Developer.—Water 10 oz., proto-sulphate iron ½ oz., glacial acetic acid ½ oz., alcohol ½ oz. The amount of proto-sulphate iron may be diminished to ¼ oz. when full contrasts are desired, or increased to 1 oz. when contrasts are unduly marked. With new bath quantity of alcohol may be reduced to ½ oz.; but when bath is old more is wanted.

Substratum.—Whites of 2 eggs well beaten, 6 pints of water, and 1 dr liq. ammon.

Intensifying Solution.—Water 6 oz., citric acid 75 grains, pyro. 30 grains. When used, add a few drops of the silver bath to each ounce.

Lead Intensification.—After neg. washing, immerse in dist. water 100 parts, red pruss. potash 6 parts, and nit. lead 4 parts. When it is yellowish white wash and immerse in liquid sulphide ammon. 1 part, water 4 parts.

Fixing Solution.—1. Potass. cyanide 200 grains, water 10 oz. 2. Sat. sol. of sod. hypo.

Varnish.—Shellac 2 oz., sandarac 2 oz., Canada balsam 1 dr., oil of av ender 1 oz., alcohol 16 oz.

PRINTING PROCESSES.

Albumen Mixture for Paper.—White of egg 18 oz., 500 grs. ammon. chlor. in 2 oz. of water. Beat to a froth, stand, and filter.

Sensitizing Solution.—Nit. silver 50 grs., water 1 oz., sod. carb. ½ gr.

Acetate Toning Bath.—Chl. gold 1 gr., acet. soda 20 grs., water 8 oz.

Lime do.—Chl. gold 1 gr., whiting 30 grs., boiling water 8 oz., sat. sol. chl. lime 1 drop. Filter cold.

Bicarbonate do.—Chl. gold 1 gr., bicarb. soda 3 grs., water 8 oz.

Fixing Bath.—Sodium hypo. 4 oz., water 1 pint, liq. ammon. 30 drops,

Reducer for Deep Prints.—Cyan. potass. 5 grs., liq. ammon. 5 drops, water 1 pint.

Sensitizing Bath for Carbon Tissue.—Bichromate potash 1¼ oz., water 30 oz., ammonia 1 dr., methylated spirit 4 oz.

Enamel Collodion.—Tough pyroxyline 120 grs., methylated alcohol 10 oz., ether 10 oz., castor oil 20 drops.

Mountant.—1. Fresh solution of best white gum. 2. Fresh starch.

Collotypic Substratum.—Soluble glass 3 parts, white of egg 7 parts, water 10 parts.

Collotypic Sensitive Coating.—Bichromate potash ½ oz., gelatine 2½ oz., water 22 oz.

Collotypic Etching Fluid.—Glycerine 150 parts, ammonia 50 parts, saltpetre 5 parts, water 25 parts.

Printing on Fabric.—Remove all dressing from fabric by boiling in water containing a little potash, dry, and albumenize with ammonium chloride 2 grammes, water 250 cubic cents., and the white of 2 eggs, all being well beaten together. A 70-grain silver bath is used, and the remaining operations are as for paper.

Cyanotype Printing.—Water 1 oz., red prussiate of potash (ferricyanide) 1 dr., ammonio citrate of iron 1 dr. Prepare and preserve in the dark. Float the paper and dry. Fixation by mere soaking in water.

VARIOUS.

Luckardt's Retouching Varnish.—Alcohol 300 parts, sandarac 50 parts, camphor 5 parts, castor oil 10 parts, Venice turpentine 5 parts.

Matt Varnish.—Sandarac 18 parts, mastic 4 parts, ether 200 parts, benzole 80 to 100 parts.

Encaustic Paste.—Best white wax, in shreds, 1 oz., turpentine 5 oz. dissolve in gentle heat, and apply cold with piece of flannel.

FERROTYPES.

Collodion.—Ammonium iodide 35 grains, cadmium iodide 25 grains, cadmium bromide 20 grains, pyroxyline 70 grains, alcohol 5 oz., ether 5 oz.

Bath.—Silver nitrate 1 oz., water 10 oz., nitric acid 1 drop.

Developer.—Ferrous sulphate 1 oz., glac. acetic acid 1 oz., water 16 oz.

Fixing and Varnish.—Same as wet collodion process.

The Photographic News Registry.

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The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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CONTENTS.

THE PRODUCTION OF PANORAMIC PHOTOGRAPHS.

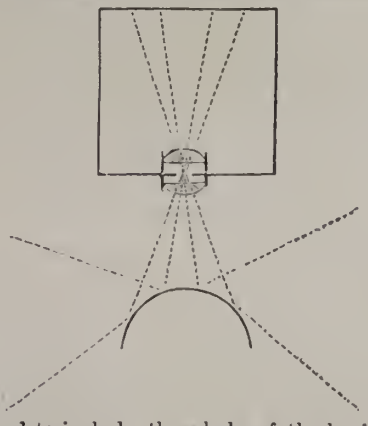
AN APPLICATION OF THE PRINCIPLE OF MCLEOD'S SUNSHINE RECORDER.

A PHOTOGRAPH in which the whole extent of the horizon is represented as a long strip has necessarily many qualities which are quite the reverse of pictorial, as when such a production is viewed as a whole the direction of light will, of course, differ in the various parts of the photograph. Notwithstanding this, such a panoramic photograph, if cut up into a sufficient number of parts, say a dozen, each embracing an angle of thirty degrees, or half a dozen, each including sixty degrees, will give a series of pleasing pictures, these being without any fault as regards perspective or cross lighting. Notwithstanding all this, some panoramic views possess qualities which make them popular, and we need only instance Gutekunst's celebrated picture of the "Centennial," at Philadelphia, to illustrate this. Here we have, however, not such a production as we alluded to at the beginning of our article, but a picture embracing, as far as we remember, an angle of about one-third of a circle of a hundred and twenty degrees. Gutekunst's picture was not taken as a whole, but impressions from several negatives were ingeniously vignetted into each other on one sheet of sensitive paper. That the desire for panoramic pictures is by no means great is pretty obvious from the fact that not one of the ingenious panoramic cameras which have been introduced from time to time is a stock article in this country, any person wishing for such an apparatus having no alternative but to have one constructed, or to endeavour to obtain one in the second-hand market.

There are, however, other uses of the panoramic photograph, and these were fully recognized when the photographic plane table of Chevallier was introduced as a surveying instrument rather over a quarter of a century ago. In the usual form of this apparatus, the lens travels round, so as to embrace all points of the horizon in succession, and the image is impressed upon a circular plate. The panoramic photographs thus obtained have a very remarkable appearance, and although admirably adapted for making photogrammetrical measurements, are valueless as pictures. The chief objection to the Chevallier plane table is its complication and delicacy of construction, consequently it has never come very extensively into use.

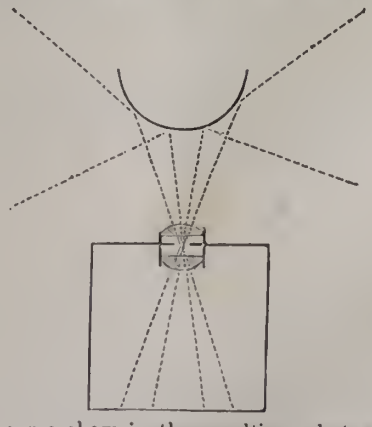
On becoming acquainted with the principle upon which Professor McLeod's sunshine recorder is constructed, it appeared to us that by photographing the reflections from a silvered ball, by means of a camera having its axis corresponding with the perpendicular, it might be possible to obtain a representation of the whole horizon on a flat plate with an instrument far less delicate in construction and far simpler than the Chevallier plane table; and, moreover, with the considerable advantage of making the exposure simultaneously for the whole of the horizon.

In order to make a preliminary experiment, one of the silvered glass balls sold for ornamental purposes was taken, and the camera was placed perpendicularly over it, as shown in the diagram. The resulting photograph was, of



course, found to include the whole of the horizon, and a sufficient vertical angle for most surveying or military purposes.

When such an instrument is used in actual practice, it would doubtless be advantageous to place the reflector uppermost, so that the heavy portion—consisting of the camera—should be at the base, as indicated by the following sketch. The vertical rods supporting the reflector



would of course show in the resulting photograph, and

would of necessity conceal—or, at any rate, render indistinct—a portion of the view; but in actual practice it might be possible to make them so narrow that the parallax of the objective would be sufficient to prevent any important obstruction to the view.

In connection with this subject many points may be raised. In the first place, it would not do to use a glass reflector silvered inside; but as there is no difficulty in silvering the outer surface, it is not necessary to say more regarding this point. The question of the shape of the reflector is one which cannot be determined without consideration, as under any circumstances the photographic representation will be very much distorted, and in making measurements from it the curve of the reflector will have to be known and taken into account. The spherical curve, a parabolic curve, and a cone suggest themselves for consideration.

It should, however, be quite possible—and, perhaps, convenient—to construct the reflector and part of the objective all in one piece, and this course would render it unnecessary to use any opaque support to hold the mirror in position.

Let us suppose a polished cylinder of glass, one end of which is concave and silvered inside, while the other extremity of the cylinder is so worked as to form part of the photographic objective. If this cylinder of glass were made to project from the mount, and the camera were set vertically, the light from the horizon, entering the cylinder, would be reflected from the silvered concavity at the top, and would pass downwards through the glass to the sensitive plate. Such an arrangement may be regarded as being virtually that figured above, but with the interspace between the outside of the objective and the reflector filled with glass, this glass being allowed for in the construction of the objective, just as is the case with the immersion-fluid in which some microscopic lenses act.

The fixed arrangement referred to above would, besides possessing the advantage of having a mirror not subject to tarnishing, be far easier to adjust than an apparatus with a detached mirror.

It might be possible to construct special optical apparatus to undistort the photographs obtained by means of the instrument just described; but as such photographs would be taken mainly for making surveys and measurements, or for military purposes, there would be no special inducement to undistort them in ordinary cases.

HINTS ON TONING, FOR AMATEURS.

The art of toning is one which the amateur is apt to give too little attention to. It is a delicate operation, and although it may appear rather a matter of detail than one of great importance, yet on the manner in which toning is done depends to a very great degree the excellence of a photograph as a picture.

Excellence in all the manipulations connected with the production of a negative, even including the making of the plates, and, indeed, excellence in every operation in the production of the finished picture up to that of toning, is common enough with amateurs. Excellence in toning is not so common.

"Nothing is easier than to tone, nothing more difficult than to tone well," has been said; and there certainly is much truth in the saying. By excellence in toning we mean not only the ability to get a good colour with pure whites and transparent shadows, but also the power of getting any tone we require, of course confining our requirements to the possibilities of the matter.

The variation produced by varying the toning bath and manner of toning is not confined to the colour obtained only, but shows itself in the general quality of the print. We have before us two prints taken from the same negative, and printed on portions of the same sheet of paper. The colour of the tone cannot be said to be very different. It would be described as a warmish brown in each case. The difference in the general appearance is, however, great. The one is a clear brilliant and pleasing picture; the other, though it would scarcely be placed in the category of "mealy prints," is a flat, dirty, uninteresting looking object. Now these two prints were toned in the same bath. They were the result of experiments in the small details of the process merely, and show how much depends on these same.

Beginning at the beginning, and taking in succession the various small matters which we have found worthy of attention if we desire to get a pleasing colour in our prints, we may take first of all the quality of the negative. As is generally known, the influence of this on the tone of the finished print is very great, but wherein this influence exists is apparently not quite fully understood. It is commonly said that a negative showing strong contrast will give a print which may be toned to a rich colour: but something more than this appears to be required. A negative with a contrast ever so great, if under-exposed, will not give a print readily toned to a pleasing colour. It is difficult to see why it should be so, but it is evident that the gradation of density of the negative is a great factor in the colour of silver prints obtainable from it. We will get, as a rule, a better tone from a negative which might be described as "somewhat delicate but full of detail," than from the densest possible negative which is even a little under-exposed.

We do not intend at present to enter into the question of the manufacture or sensitizing of the paper, because, as a rule, amateurs use ready-sensitized paper. We therefore pass on to the actual printing. It is an opinion commonly held that the longer, within limits, a print remains exposed in the frame—that is to say, the poorer the light—at the time of printing, the better will be the tone. It is certainly the case that prints done in very brilliant sunshine, and therefore in a very short space of time, do not, as a rule, tone as well as those which have taken longer to print; but we have not found the difference to be very great.

The manner of keeping the paper both before and after printing is a matter of importance, as we all know ready-sensitized paper turns brown from being kept. It may, however, turn in two totally different ways. It sometimes turns of the same colour that it would were it slightly exposed to light. This appears to be the effect of the action of pure air and damp, and does no harm so far as the colour obtainable by toning is concerned. There is, however, a very different discolouration which results from exposure to the smoky impure air of London, and probably comes about from the action of sulphur in some form. It is distinguished by a metallic lustre; the effect of this is disastrous on the tone of the print. Nothing but the most sickly colour is possible from paper which has turned its colour in the manner described. From this we gather the importance of keeping ready-sensitized paper in a place where the air is as pure as possible.

It is probable that the stage at which the most can be done to make or mar the tone of a print is that of the washing which is performed previous to the toning. If, for example, the prints be placed in the water in masses, and be allowed to adhere one to another for any length of time—or, in fact, if they be allowed to remain for any length of time in water which contains a considerable quantity of the free nitrate of silver which washes out of them—ruination of the tone will be the result.

It appears to be of importance to get the first silver which is washed from the prints away from them as quickly as possible, and for this reason they should be placed first in a large vessel, and should be removed from this first washing vessel to a second, after a very short immersion.

The next point of importance is the extent to which the

washing should be carried. Here let us say that we are in favour of eliminating all, or very nearly all, the free silver nitrate by very thorough washing, and by a fairly thorough washing followed by the application of a solution of common salt to convert what silver nitrate is left into chloride.

There appear to us to be various objections to the presence of free silver nitrate in the prints at the time of toning. For one thing, it is a very uncertain factor in the process. We never can tell how much we have washed away and how much we have left, and consequently there is uncertainty introduced in the result. When we wash out all the silver nitrate the uncertainty ceases; and not only that, we find that if, as certainly is the case, the toning takes much longer, or requires a much stronger solution of gold, the result is infinitely better than that got when silver nitrate is present. A further great advantage lies in the fact that prints toned without the presence of silver nitrate do not change their colour in the fixing bath; those toned in its presence do. We have, therefore, if we have thoroughly washed our prints, merely to wait for the colour we require, and then to remove the print from the toning bath. It certainly is the fact that with most ready-sensitized paper it is impossible to get a very good purple tone. We can, however, get a very warm brown.

Concerning the use of the salt solution, it would appear from mere theoretical reasoning that there can be no need for any washing at all before using it. It is difficult to see why it should be objectionable to get rid of the whole of the silver nitrate by converting it into chloride, but the fact remains the same that we do not get a good result if we place the prints direct from the printing frame into the salt water. It is also a fact that if the salt solution be beyond a certain strength, the prints refuse to tone at all. Considering these two facts, it becomes merely a matter of experiment to determine how to use the salt. We have proceeded as follows with good results.

We wash the prints till the greater part of the muddiness of the washing water has disappeared; this means three or four changes of water. We then dip for ten minutes in water which contains half-an-ounce of common salt to each gallon. After that we wash in other three changes of water, and proceed to tone.

The only difference in the manipulation in toning the two prints mentioned above was that the first was allowed to soak for some time in its first washing water, and was then but imperfectly washed. The second was at first rinsed briskly in running water, and was afterwards treated with the salt solution as described. It took five or six times as long to tone as the first.

For the sake of completeness we give the formula we were using, although we believe the difference in result produced by different toning formulæ is vastly less than the difference which may be brought about by varying mere details of manipulation:—

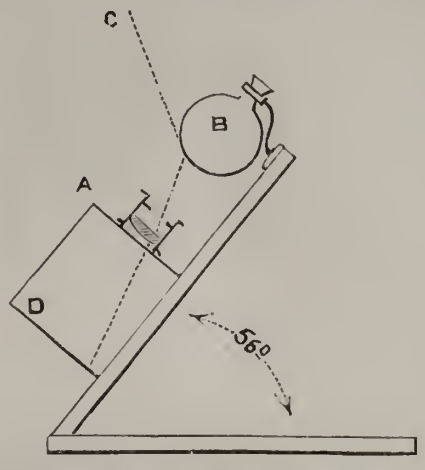
Chloride of gold	...	...	...	1 grain
Borax	...	...	...	60 grains
Water	...	...	...	12 ounces

McLEOD'S SUNSHINE RECORDER.

This instrument, to which we have already referred, possesses characteristics which seem likely to make it more generally adopted than the forms of recording apparatus now in use, the most notable feature being the use of a glass sphere (or rather hemisphere, for it is only one-half of the sphere which acts) silvered inside as a means of reflecting the solar rays into an ordinary camera; and we cannot but think that Professor McLeod's ingenious idea may receive other important applications in photography (see page 481).

McLeod's sunshine recorder consists of a camera fixed with its axis parallel to that of the earth, and with the lens northward. Opposite to the lens there is placed a round-bottomed flask, silvered inside. The solar rays reflected from this sphere pass through the lens, and act on the sensitive surface.

The construction of the instrument is illustrated by the subjoined cut, A being a camera supported at an inclina-



tion of 56 degrees with the horizon, and B the spherical flask silvered inside, while at D is placed the ferro-prussiate paper destined to receive the solar impression. The dotted line C may represent the direction of the central solar ray at one particular time, and it is easy to see how the sunlight reflected from the flask always passes through the lens. As the sun moves (apparently) in a circle round the flask, the image formed by the lens moves round on the sensitive paper, forming an arc of a circle.

Although it is obvious that any sensitive surface might be used in the McLeod sunshine recorder, the inventor prefers at present to use the ordinary ferro-prussiate paper as employed by engineers for copying tracings, as this paper can be kept for a considerable length of time without change, and the blue image is fixed by mere washing in water; another advantage is the circumstance that a scale or set of datum lines can be readily printed on the paper from an engraved block, and if the printed papers be made to register properly in the camera, the records obtained will show at a glance the time at which sunshine commenced and ceased.

We understand that a description of the apparatus will shortly appear in the *Philosophical Magazine*, but the above account is quite sufficiently detailed to enable any person to fit up the apparatus in an extemporised form. Instead of specially silvering a flask inside it will be found convenient to make use of one of the silvered globes which are sold as Christmas tree ornaments.

The sensitive fluid for preparing the ferro-prussiate paper is made as follows:—One part by weight of ferricyanide of potassium (red prussiate) is dissolved in eight parts of water, and one part of ammonio-citrate of iron is added. This last addition must be made in the dark-room. A smooth-faced paper is now floated on the liquid and allowed to dry.

By-the-Bye.

GLASS AS A BURDEN TO THE TOURIST.

In computing the weight of the various items for a photographic tour, the glass almost invariably comes out at the head of the list, and the farther or longer the journey, so much more does the weight of the plates stand out pre-eminent: indeed, if one goes out on a trip with only three dozen half-plates, the glass will probably weigh nearly as

much as camera, backs, and tripod, in spite of the stipulation with the maker to supply plates on "thin glass."

For all this, one must not look hardly on glass, for it seems to us that the glass plate has made photography what it is: and we may very well date the birth-time of photography as a really popular pursuit from the time when Archer introduced his collodion process rather more than thirty years ago. As a material upon which to make negatives, glass is simply incomparable; its beautifully smooth surface, its rigidity, the ease with which it can be cut without interfering with the general flatness of the surface, and its unalterability when subjected to all ordinary chemical reagents, are qualities of so much value, that one can see no probability of its place being usurped by any of the substitutes which have been suggested, unless under very exceptional circumstances. Before, however, considering the practicability of the tourist making use of a less weighty support than glass for his sensitive films, it may not be amiss to enquire how far the glass itself may be made more useful.

If one purchases plates without any stipulation as to thinness, they are often supplied on thick glass weighing nearly two pounds to the square foot, or even more: while any request for "thin glass" may not only prevent the delivery of the plates in due time, but may necessitate the accepting of a portion of a batch which, under other circumstances, would have been considered hardly good enough to send out, or, what is perhaps worse, the customer may merely get a selection of the thinnest glasses from several batches of plates. Indeed, as a matter of fact, a request for "thin glass" seldom secures plates weighing much less than 16 or 18 ounces to the square foot.

There is in the market—or, perhaps, one might more correctly say out of the market—an exceptionally thin glass, either patent plate or extremely fine sheet, which sometimes is so thin as to weigh no more than six ounces to the foot. Such glass being altogether an exceptional article, and very seldom asked for, is by no means cheap; but it can hardly be doubted that if a demand were created for it, the price would drop to something quite reasonable.

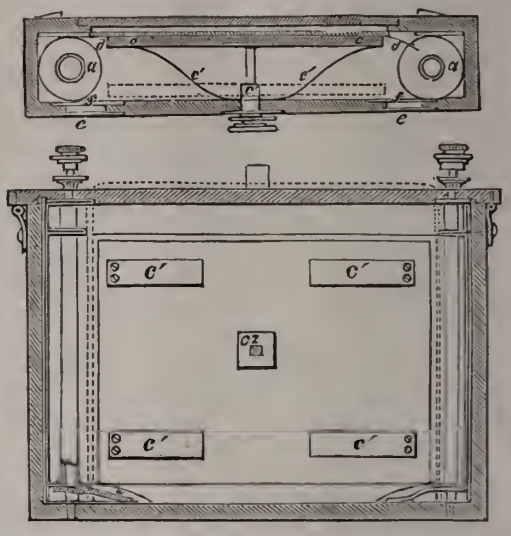
To reduce the weight of his glass packages to one-third, and perhaps of his whole kit to one-half, is by no means a trifling consideration to the photographic tourist, and if the manufacturers of dry plates were to obtain such thin glass as we allude to, and to hold a stock of plates prepared upon it, it is probable that more plates would be used, and that both they and their customers would be gainers.

For very small sizes it might be possible—indeed, it is possible—to use the thin glass sold for covering microscopic objects; but the general use of this extremely thin glass would perhaps offer difficulties as great as those arrising from the employment of one of the substitutes for glass to be alluded to presently. Still, for the small plates—say two inches square or so—used in photographic artillery, whether in gun or revolver form, the microscopic glass is excellent.

Next in importance to glass as a support comes paper, and it is quite easy to understand that the tourist in out-of-the-way parts might be able to take an apparatus containing a roll of sensitive paper, when it would be altogether impracticable for him to take an equivalent surface of coated glass, and in such a case the roller slide becomes of especial value.

The roller slide of Melhuish is to lerably well known, and is, we believe, now obtainable as an article of commerce. The slide is fitted up with two rollers, *a a*, and the sensitive sheets, *b b*, are gummed together, making one long band, the ends of which are gummed to pieces of paper always kept on the rollers. The sensitive sheets are wound off the left or reserve roller on to the right or exposed roller, until all are exposed.

The rollers are supported on springs a^1 a^1, to render their motion equal; they are turned by the milled heads *m m*, and clamped when each fresh sheet is brought into position by the nuts a^2 a^2; *c* is a board which is pressed forward by springs, *c' c'*, so as to hold the sheet to be exposed, and keep it smooth against the plate of glass, *d*; when the sheet has been exposed, the board is drawn



back from the glass in order to release the exposed sheet, and allow it to be rolled on the exposed roller: the board is kept back while this is being done by turning the square rod c^2 half round, so that the angles of the square will not pass back through the square opening until again turned opposite to it; *e e* are doors, by opening which the operator can see (through the yellow glass *y y*) to adjust the position of the sensitive sheets when changing them.

The remarkable similarity of such a slide to the automatic printing-frame described last week will strike the reader; and, like the printing-frame, it possesses the advantage of speed in working—no small consideration to the photographer in a distant, and possibly hostile, country.

Fine paper well sized with an insoluble size, and coated with a sensitive emulsion, is, we believe, the very best material to use in the roller slide, and such a paper might be made in long lengths at a very low price, a coating machine similar to that constructed for use in making carbon tissue being employed. We have used such paper with success, and hope that some manufacturer will introduce it into commerce before long. But the question suggests itself, how are the paper negatives to be rendered transparent, and how is the grain of the paper to be obliterated? Simply by pressure, as extremely heavy rolling will render such paper almost as transparent as glass, a fact abundantly demonstrated by Mr. Woodbury in his experiments on the Photo-Filigrane Process, and confirmed by some trials which we have made.

It must be confessed that roller slide experiments which we have made with sensitive films supported on gelatine sheets, or on such composite sheets as the alternate rubber and collodion pellicle of Mr. Warnerke have been hardly satisfactory—possibly, however, from our own want of skill; while no form of the Calotype Process which we have tried has proved so satisfactory as gelatino-bromide paper.

NOTES FROM NEW YORK.

PROPOSED NATIONAL ASSOCIATION OF AMATEUR PHOTOGRAPHERS—A CONCENTRATED ALKALINE DEVELOPER—THE COMING ANNUAL CONVENTION OF THE PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

At a recent meeting of the Society of Amateur Photographers, the results of the first field excursion made up the

Hudson River on June 20th were compared, and among the interesting things brought out was the uncertainty of gelatine plates. One gentleman had used two plates of English manufacture which were packed in the usual manner, film sides together, and separated by a thin sheet of paper. During development, a large, irregular, insensitive patch appeared on each plate, one and a-half inches diameter. After the plates were fixed and dried, it was found that the patches matched each other when the films were placed in contact. On explaining the cause, Mr. Beach said he had had a similar experience a year ago, and produced two negatives with patches which exactly matched. The insensitiveness was supposed to be due to some chemical action between the paper and the damp gelatine film, the probability being that the plates had been packed before the film had become thoroughly dry, or else the dampness of the ocean voyage had affected the film. The experience described will not tend to promote the use of gelatine plates, unless they are packed in a better manner. Two excellent negatives were ruined from this provoking defect.

The subject of the formation of a National Association of Amateur Photographers was discussed, and the officers were authorized to correspond with fellow societies to further that object. By some, a national association composed of representatives of amateur clubs from all parts of the country is regarded as of much importance, as it would bring together amateurs, and give them facilities for comparing and exhibiting their work which they would not otherwise possess. One meeting a year is all that is contemplated, which would include exhibitions of choice work.

Mr. Beach, having met with much success in the development of his negatives taken on the Hudson trip, gave to the meeting the following formula for a pyro developer which he used :—

No. 1.—*Pyro Solution.*

Warm distilled or melted ice water ...	2 ounces
Sulphite soda (chem. pure) 437 grs. to ounce	2 ,,
When cold, add—	
Sulphurous acid...	2 ounces
Then add—	
Pyro (Schering's) ...	½ oz. of 218 grains

which is done by pouring the sulphite solution into the half-ounce of pyro bottle, repeating the pouring until the pyro is dissolved. The resulting solution should be filtered, and kept in a tightly-corked bottle, and will measure about five fluid ounces. Its strength will be 44 grains of pyro to each ounce, or approximately, a ten per cent. solution.

No. 2.—*Potash Solution.*

which is made of two separate solutions prepared as follows :—

A.—Water	4 ounces
Chem. pure carbonate of potash (437 grains to ounce)	3 ,,
B.—Water	3 ounces
Chem. pure sulphite soda (437 grains to ounce	2 ,,

A and B are then combined into one solution, which will be concentrated and of uniform strength, always ready for use, and will measure between eight or nine fluid ounces. To develop an 8½ by 6½ plate which has had a drop-shutter exposure, take water three ounces, and add thereto half an ounce of No. 1 and 3 drams of No. 2 or the potash solution, increasing the latter to 5 drams in case the image hangs back. For a plate which has had the proper exposure, or which has been somewhat over-exposed, add to the 3 ounces of water 3 drams of No. 1 and 1 dram of No. 2. After a minute's time, if the image fails to appear, add a second dram of the potash, repeating the additions at intervals of a minute until development commences. By adopting such a plan of development, Mr. Beach claimed that almost any plate could be successfully developed without the use of a bromide; the development can be prolonged, will be under perfect control, and there is no fear of fogging the plate. The danger of the green fog is avoided, and bluish-grey, clear, quick-printing negatives are obtained at once without the necessity of using alum or other clearing solutions. The developer remains clear, and from four to five plates can be developed in succession with one solution.

Mr. H. J. Newton exhibited a specimen of starched glass as a substitute for a ground glass. Many formulas had been given, but he claimed they did not go far enough. His method was to add to three ounces of water thirty grains of starch, which must be thoroughly mixed, and all particles broken up and well incorporated. It must then be thoroughly cooked or boiled for five minutes, strained through fine muslin—such as a handkerchief—cooled, and lastly poured on the plate, being carried uniformly to the edges with a glass rod. When drained and dry the plate is ready for use. The specimen shown possessed a very fine grain.

In reply to a question about silvering paper, Mr. Newton remarked that he had an excellent formula by the use of which fuming with ammonia was not necessary. It may not be new to your readers, but I give it as follows :—

Water	1 ounce
Nitrate of silver	40 grains
Nitrate of ammonia	30 ,,
Liquid ammonia	3 minims

The paper is floated upon this solution for three minutes, and is then drawn off the edge of the dish next to the operator in such a way that the paper is held by capillary attraction to the edge. The object is to avoid the use of a glass rod; no fuming is required. The bath should be kept in the light when not in use. It will test from 54 to 56 on the hydrometer, and will always remain clear. It must always be kept alkaline, and as it becomes acid from continued use, more ammonia must be added.

Another gentleman, Mr. Partridge, exhibited a few excellent transparencies made on the new Anthony transparency plate which is being manufactured under the supervision of Mr. T. C. Roche, who is the inventor of the process. The plates possess great latitude of exposure, are of the insoluble type, and dry with remarkable rapidity. They promise to be of much value to our amateurs.

I have lately seen an announcement published in one of the English journals, of Mr. A. L. Henderson's intention to sail for this city on the 11th inst. Should he come he will be welcomed by all of our photographers here. Had it not been for the sudden outbreak of cholera in France our enterprising and popular photographer here, Mr. George G. Rockwood, would have taken his usual summer European tour. He had intended to have sailed by the new steamer, *America*, on the 16th. Among the first to avail themselves of the dark room of our Amateur Society was a young English amateur who came over on the same steamer when she made her maiden trip. He secured some excellent drop-shutter views from the deck of the steamer, and one or two fine interiors of her beautiful grand saloon.

The coming photographic event is the holding of the fifth annual convention of "The Photographers' Association of America" at Cincinnati, Ohio. It is to convene in Music Hall, one of the largest halls, on July 29th, and will continue till August 2nd. The officers are :—J. H. Kent (President), Leo. Weingartner (Secretary), W. A. Armstrong (Treasurer), J. F. Ryder, and E. Klauber (Executive Committee). One of the attractive features will be the awarding of prizes by the different plate makers for the best photographs made on their respective plates. Considerable rivalry has been exhibited, which will terminate for the time being at the Convention. Some rivalry also exists in current photographic literature, as we are to have a weekly *Photographic Eye* in competition with *Photography*, a bi-monthly, both emanating from our energetic Western city, Chicago.

THE AMATEUR PHOTOGRAPHER.

New York, July 19th, 1884.

Practical Papers for Beginners.

No. 3.—EXPOSING AND DEVELOPING THE FIRST DRY PLATE.

In the first place one must provide the necessary chemicals, and arrange them conveniently for work, and in our present instructions we shall only deal with development by pyrogallic acid, as this is the method ordinarily employed, at least in England; and which perhaps is, on the whole, to be preferred for a beginner.

The solutions required are as follows:—

No. 1.—Developing Solution.

Strongest liquid ammonia ...	½ fluid ounce
Bromide of potassium ...	70 grains
Water	1 pint

A stoppered bottle is convenient for containing this solution, and the ammonia should be measured out in a glass measure, such as those used by the druggist, while the bromide of potassium must be weighed out by means of a small pair of druggist's dispensing scales having pans about two and a half inches across. Very often the pans are made of glass, and in this case the bromide may be weighed out directly on the pan. In any other case it is convenient to select a watch-glass which will easily go on the pan, and to make a metal counterpoise exactly balancing it; this counterpoise being, if preferred, permanently soldered to the pan in which the weights are placed. After having used the watch-glass for any chemical, it should be washed and dried before using it again. Instead of measuring out a pint of water in a separate measure glass each time a solution is made up, it is convenient to make a file scratch on the outside of the bottle, showing the height of the fluid when the batch of solution is first prepared; so that subsequently it is merely necessary to make up with water to the mark. The water supplied to towns is generally sufficiently pure for making up the above solution; but extremely hard water is undesirable, so that if the water supply is very bad, it may be desirable to make use of distilled water. Distilled water may be obtained from any druggist. The bromide of potassium soon dissolves, and when this has taken place, the contents of the bottle should be once agitated, as it generally happens that a dense stratum of strong solution is formed, and this may remain at the lower part of the bottle a long time.

No. 2.—Developing Solution.

Pyrogallic acid	60 grains
Water	1 pint

It is convenient to make this up in a bottle of a different pattern from that containing No. 1 Solution, as by so doing the probability of mistaking one for the other in the gloom of the semi-dark-room is diminished. The pyrogallic acid dissolves almost instantly in the water, and as putting it through the neck of the bottle is rather a troublesome operation, it is convenient to tilt it out of the scale pan into a glass tumbler or beaker, and pour a little water on it. The strong solution thus obtained is poured into the bottle, the glass being rinsed with a little more water, and the rinsings are added; after which the volume of the solution is made up to one pint by adding sufficient water to come level with the file mark (which we may suppose to have been previously made on the bottle). A slight agitation ensures the uniformity of the solution.

The above solutions are all that are required to develop a dry plate, although, as we shall point out subsequently, it is convenient to have the three factors of the developer—ammonia, pyrogallic acid, and bromide of potassium—at hand in a convenient form for adding, should there be occasion, and other preparations are occasionally required. Still, at the present stage it is necessary to prepare the so-called "fixing solution," the use of which is to remove from the developed plate all that excess of sensitive bromide of silver which has taken no part in the formation of the image.

Fixing Solution.

Hyposulphite of soda	4 ounces
Water	1 pint

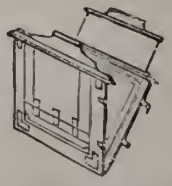
During the dissolving of the hyposulphite of soda in water, a considerable degree of cold is produced, and it should not be used until it has acquired the normal temperature.

A few glass or earthenware cups, and two or three flat dishes—say of ebonite—complete the set of apparatus necessary for a first attempt at development, it being assumed that the beginner purchases his sensitive plates ready made.

The dark slide, or shallow box which serves as a vehicle for taking the plates from dark-room to camera, and *vice-versa*, is represented by the subjoined figures.

The so-called single dark slide has a door at the back, which opens on hinges. When this door is opened, the grooved or recessed corners which support the plate in position are shown, and the plate having been put, film downwards, in position, a spring attached to the hinged door serves to hold it firmly in the recess. After the dark slide has been fitted into its grooves on the camera, the plate can be uncovered by withdrawing the sliding shutter which is next the sensitive film, this shutter being shown in the subjoined diagram as partially withdrawn.

For dry plate work it is usual to make use of the so-called double dark slides, which contain two plates back to back. Such a dark slide usually opens in the middle, as indicated below, and in closing it a little care must be



exercised to see that the two plates are fitting properly in the recesses, and that the thin light-proof partition which separates them is clear of the hinged part. A dry plate camera is ordinarily provided with several double backs, so as to allow of a number of plates being taken out on a tour: the sliding-shutters being usually numbered in regular order.

The beginner will, of course, purchase plates of the size corresponding to the rebates or recesses of his dark slides; but as cameras are almost invariably made to stock sizes, no difficulty is likely to occur in this respect.

The package of plates having been carefully undone in the dark room, the film side of each plate should be carefully dusted with a broad camel's-hair brush before putting into the slides; and as even the best slides are not perfectly proof against a strong light, it is well to provide a kind of envelope of American waterproof cloth for each slide.

We assume the central card of the focimeter to be carefully focussed on the ground glass, and that the dark slide containing plates Nos. 1 and 2 is placed in position, so that all is ready for the withdrawal of the shutter which intervenes between No. 1 plate and the lens; but, before withdrawing the shutter, it is necessary to determine the time of exposure.

Exposures may vary from a minute fraction of a second

to several hours: one main difficulty with beginners being to judge the length of time during which the luminous image formed by the lens shall act on the sensitive film, and many very complex systems of actinometry have been devised as aids in the matter. As there is one great variable in all these calculations—namely, the photographic energy of the light—the remaining calculations become stultified, and the most successful photographers trust to experience alone to guide them. We therefore do not intend to now enter into any one of the various modes of estimating the time of exposure, but recommend the beginner to adopt an empirical or experimental method.

Having everything adjusted as described, place the cover or cap upon the lens, draw the sliding shutter which comes between lens and plate, after which remove the cap for an instant and replace it as quickly as possible, taking great care not to shake or shift the camera in removing or replacing the cover.

Now remove the dark-slide and take it into the developing room, and place the exposed plate film upwards in one of the flat dishes. In order to screen it as much as possible even from the coloured light of the dark-room, a sheet of millboard or other opaque material should be laid over the dish while the developer is being mixed.

For a first experiment, pour out into two separate cups or glasses about equal parts of developing solutions No. 1 and No. 2, an ounce and a-half of each being sufficient if the plate is 5 inches by 4, and mix these solutions by pouring the content of one cup into the other. Now uncover the plate and pour on the solution with a steady and even sweep, at the same time rocking the dish. If the whitish surface of the plate becomes instantly darkened all over, it is pretty clear that the exposure to light was too long; but if, on the other hand, the darkening sets in very slowly, and after a minute or so only a dark patch can be seen here and there, the exposure has been insufficient. In the former case, the developer should be rinsed off with abundance of water, and in the latter case it should be allowed to act until the darkening has set in more or less all over the plate, or this failing, for about ten minutes. In any case the developed plate must be rinsed in four or five changes of water, allowing half a minute or so for each rinsing, and some of the fixing solution is now poured over it.

The dish containing the plate may now be taken out into full daylight, and as soon as all traces of the milky-white or yellowish bromide of silver have disappeared, the plate may be held up to the light and examined. If the writing or printing shows clearly on any one of the focimeter cards, the plate is a success as far as our present object is concerned, and it should be placed in a dish of water in order that the excess of hyposulphite may soak out. If, however, the plate is so far under-exposed as to be almost transparent when held up to the light, with scarcely any image whatever, excepting a dark shade where the extreme lights of the subject have acted, another exposure must be made, allowing, perhaps, four times as long; while in the case of the writing or printing being undistinguishable from over-exposure, indicated by a very weak image with faint details all over the plate, there is no alternative but to set up the apparatus in a place where the light is less intense, as the ordinary expedient of cutting off some of the light by the insertion of a small stop or diaphragm (a perforated disc of metal, of which several are ordinarily supplied with a photographic lens), is not allowable when testing the lens by means of the focimeter.

It is, however, most probable that the first plate will show the figures on the focimeter with quite sufficient distinctness, and it is now necessary to determine which of the cards has given the clearest and best-defined impression on the sensitive plate. Let us suppose that it is one six degrees from the central one. In order to bring camera and lens into adjustment, it is now necessary to remove the sheet of ground glass from the focussing-frame, and to reset it in such a position that the card which appeared sharpest on the photographic plate shall show most distinctly on the ground glass, the relative position of camera, lens, and focimeter not being disturbed meanwhile.

The ground glass can be set deeper in its frame by cutting away the rebate, or it can be brought forward in its setting by using strips of cardboard, so as to make the rebate shallower. In order to ensure that the correction is satisfactory, the central card should be once more focussed, and another plate should be exposed. The correction by the focimeter as described above is not theoretically perfect for all distances in case of a difference between the photographic focus of a lens and its actinic focus, but it is sufficiently exact for all ordinary purposes.

If the beginner wishes to preserve his first negative, he should soak it in four or five changes of water, leaving it for ten minutes or so in each; after this the plate should be placed in a nearly vertical position to dry, one edge being allowed to rest on a clean piece of blotting-paper.

In our next Practical Paper we shall deal with the adjustment of the exposure to the developer, and also say a little about adapting the developer to the exposure.

Notes.

Our pictorial supplement this week is a photograph of the *Diligence* on the point of starting from Bordj-bon-Arreredj for *Ménérville*. Mr. Pritchard thus described the incident of taking the picture:—"As I wanted to take the machine at the moment of starting, with the driver on the box, ribbons in hand, and the passengers in their places, it was necessary to get the driver's good will first of all. Now, many men in this world are nice unassuming fellows enough until you ask them a small favour, and then the unexpected position of exercising patronage suddenly changes their nature. Our driver was one of this class, and he suddenly became very official in his demeanour as soon as I preferred my request. He hummed and ha'ad, and really did not know whether he could sanction such a thing. 'It won't take two minutes,' I urged, as he looked so serious over it all. No doubt he meant to comply from the first, but it would not do to, accord permission out of hand. So, after due deliberation he said: 'Pas plus que deux minutes? Eh, bien, soit.'"

The fifth annual convention of the Photographers' Association of America commenced on Tuesday. The meetings this year take place in Cincinnati. Why should not a similar gathering of associations be held in England?

A member of the City of London Bicycle Club thinks he has solved the problem as to the best tricycle for carrying purposes. He used a "carrier" tricycle, similar to the one adopted by the *Standard* newspaper and the Post Office, and in the wicker basket he placed his two younger daughters, who, with luggage, weighed one hundred and forty-four pounds! With these *impedimenta* he journeyed to Bath, and reports that the weight was so admirably adjusted that it *facilitated rather than hindered* speed. The occasions are very few when photographic apparatus would weigh a hundred pounds.

Madame Modjeska once gave a hint which persons who sit for their photographs would do well to bear in mind. The charm of Madame Modjeska's features lies in their expression, and, when in repose, her face is not what would be called beautiful. She sat for her portrait to a well-known painter, and some friends, criticising the picture afterward, and comparing it with the animated face of the original, declared it was not like her. "Wait," said she, "and you will see;" and putting on the exact expression which the painter had caught, it was admitted that, under certain aspects, the picture was a faithful reproduction. Photographers are sorely tried by sitters with mobile features, and if the possessors of the latter would only look, when they show their photographs, as they did when sitting, the photographer would be saved much unmerited blame.

The prize in the competitions referred to last week, which had for its object the suggestion of an original pose for a photographic sitter, has been awarded to a competitor with the *nom de plume* of "Grosvenor." This is Grosvenor's answer:—"Pose after well-known pictures in the National Portrait Gallery, or after the statues in Westminster Hall and Corridors; or after the advertising pictures of the 'Monks' or 'Dirty Boy'; or in the dress of an Arab, Turk, Norwegian; or steering a property gondola; or seated in ear of a balloon; or take the front and back of sitter at the same time, fixing both photos on same card—one on front, the other on back."

The Puzzle Editor states that the two guineas are given with special reference to "Grosvenor's" last suggestion, which was one, by the way, to which we drew special attention last week. The notion is worth consideration, perhaps.

Photography and electro-plating cause a constant loss of the precious metals; the gold and silver which are sent into the market as finished photographs, or in the form of plating, but seldom returning to the refiner.

Gold is, however, of quite secondary importance to the photographer, and would no longer be required if the photo-mechanical methods of printing were to become universal; while the constantly-increasing turn-out of silver seems to point to a notable reduction in price. Last week we gave some particulars regarding the new silver districts in Australia.

The standard of pureness for silver coin varies much, even at the present day. According to Mr. W. Chandler Roberts, Dutch silver stands highest, as it contains no less than 945 parts of the precious metal in a thousand; while the English standard is 925, the Brazilian 917, and that of British India 916. The Monetary Convention of 1865 fixed 900, or ten per cent. of alloy as the standard in France, Italy, Belgium, and Switzerland, the United States having subsequently adopted the same degree of pureness; and below 900 we have Russian roubles containing 868 of silver in the thousand parts, the Turkish piastre containing 830, Javanese currency containing 720, while Austrian kreutzers often contain less than half their weight of silver.

Why that irrepressible but generally inaudible nobleman, Lord Denman, was so anxious to have photographs taken of the head of the "Iron Duke's Statue," he did not inform the House of Lords last Monday. The result, we should imagine, would not be of a very pleasing character, and it is just as well, perhaps, that, as Lord Sudeley explained, the application has been made too late.

It seems that the Great Commander's head has positively left London for Aldershot—packed, possibly, in its own "trunk;" and if Lord Denman really wishes a carte of it so much, he should return to the charge, and ask that it may be photographed on its arrival at the Camp, and before it is again placed *in statu quo* on the appropriate site selected for it at "head"-quarters.

There was a photographic question in the House of Commons, too, last week. Mr. J. Huntley McCarthy wanted to know all about the galvanized iron excrescence which now constitutes such an eyesore in front of the National Gallery. It is so far satisfactory to learn that this hideous erection is to be of a temporary nature only, but it would overtax Mr. Shaw Lefevre's ingenuity to have to explain why even for a single hour the "finest site in Europe" is disfigured by the abortive studio. Even if so studiously ugly an edifice were required—which we deny—there can surely have been no need to plant it in, perhaps, the most prominent position the whole of the vast metropolis is able to furnish.

We alluded, a week or two since, to Colonel Hoe's suggested plan of printing newspapers by photography. The gallant officer now says that 360,000 copies of a journal could be easily produced by his method in an hour. The only drawback to the realization of his plan is the high price of the sensitive paper which would be requisite. But doubtless if we wait a little, the Colonel will surmount this difficulty. The newspapers of the future, in fact, will probably be flashed to a wondering world without the use of paper at all.

Since the famous farewell banquet to Henry Irving last year, when the table napkins used were each adorned with a copy of his photograph, the fashion thus set has largely developed. Instead of the ordinary marking, by the use of worked or written initials or monograms, many people now have their photographs in miniature reproduced on their handkerchiefs, table-cloths, counter-panes, &c.; and the fact that the said photographic impressions come unscathed through the ordeal of washing is likely to place marking-ink at a discount ere long.

A contemporary, in advocating this new mode of marking, suggests that one of its chief merits will be that the most hardened laundress will scarcely dare to retain articles which would actually haunt her with visions of her wronged customers if not promptly returned. The plan

might be extended to the linings of hats, too, and surely some genius will be able to show us how to adapt it to our umbrellas as well. The most confirmed "gamp lifter" would surely be moved to restitution should he, on opening his most recently-annexed umbrella, find the face of its injured owner gazing reproachfully down at him from some point in its concavity.

A Brooklyn photographer who has been disposing lately of a number of M. Grye's photographs of Venus, taken during the transit of 1882, has caused much amusement by putting in his window, side by side, a "cabinet" of the famous Louvre Venus, with one of the above astronomical views, and labelling them "The Venus of Milo!" and "The Venus of Twenty-seven Million Mile 'Oh!" respectively.

Some weeks ago we noticed the gradual way in which a plate 6½ by 4¾ has become very generally regarded as a "half-plate," instead of the old legitimate half-plate, 6½ by 4¼. The Chicago fortnightly *Photography*, commenting on this, remarks that the Americans have altered the proportion of the half-plate in a somewhat similar way, but instead of increasing the width they have reduced the length. The "half-plate" generally used in the United States is 4¼ by 5½.

Truth brings forward, as a photographic *novelty*, the method of producing life-size portraits in oils adopted by the Société Parisienne. This method, according to our contemporary, is the idea of a Frenchman who had noticed that the pupils in the Viennese Art Schools were unable to turn their artistic talents to account, and suggested that they would find plenty of work in the painting of life-size reproductions from photographs. The reflection of the portrait is "thrown from a camera-obscura (optical lantern?) life-size on to canvas, and the pupils then set to outline it, filling in with oil-colour on the same canvas afterwards." *Truth* is informed that the invention is already becoming a source of income to many a poor art student in Vienna. This is possible, but the plan is by no means the new idea which *Truth* supposes.

Photography was of signal service to the picture connoisseur a few weeks ago. In the Leigh Court collection recently offered for sale was a "Venus and Adonis" of Titian, and this picture, it was asserted, was painted for Phillip II. of Spain, because of a fold across it, the presence of which blemish the monarch, in a letter to Francesco Vargas, December 6th, 1554, laments. On the other hand, it was claimed by Messrs. Crowe and Cavalcaselle that this picture is now at Madrid, as it not only contains a furrow across the centre, but two others lower down, showing that it had been rolled and squeezed flat. These markings are distinctly shown in a photograph, by Laurent, of the Madrid picture, and on comparison with the Leigh Court Titian, it was found there was a considerable difference, the marking in the English picture being clearly caused by a join in the canvas, two lengths having been joined together to form one. The honour has therefore been awarded to the Madrid Titian.

An ingenious artist, dating from the Isle of Thanet, amuses himself every day after dinner by photographing the state of the joint as it leaves the table. By thus taking it, he says, he makes it inexpedient for the landlady to take it.

Satisfactory photographs of brightly coloured objects are rare, but so much attention is now being given to the conditions under which good pictures may be obtained from coloured originals, that one may hope for real progress in this direction.

Dr. Vogel sends us a chromo-lithograph in which bright blue, crimson red, and clear yellow are the main components, and the whole colour scale is exaggerated beyond anything to be seen in nature. A print from a negative taken on an ordinary plate shows the yellow and red as nearly black, while the blues are reproduced as white; but it is altogether different in the case of a print from a negative made on one of Vogel's azaline plates, as here blue and yellow have almost the same value, while red shows nearly black. In the first instance the character of the original is lost, in the latter it is maintained.

Although it has been denied that any great advantage is to be expected from the use of isochromatic plates for ordinary landscape work, we have received an exceptionally fine landscape picture by Senhor Anthero Araujo, of Oporto, taken on one of Clayton's isochromatic plates. We do not remember ever to have seen a better reproduction of the shades of green in foliage.

The Maori king has been photographed by Mr. Mayall. It would be interesting to know whether his Majesty's opinion of the photographic process corresponds with the description once given by a native of New Zealand, who said that the photographer "looked through his one eye at the trees, and then he took a piece of glass, spat on it, put it in a box, and then the trees came on the glass. It was very wonderful!"

The United States now possess a weekly photographic journal, the *Eye*, which has hitherto been issued in Chicago as a general paper, with merely a few columns devoted to photography, having commenced a new series as No. 1, Vol. I. of the *Photographic Eye*.

The old newspaper size of the pages being retained, the journal will hardly be a very convenient one for reference and binding.

Patent Intelligence.

Applications for Letters Patent.

10,558. Count Stanislas Julian D'Ostroróg, 5, Conduit Street, New Bond Street, Middlesex, trading under the name of "Walery," for "Improvements in obtaining pictures on enamel fixed by fire."—Dated 24th July, 1884.

10,567. Fredk. Wm. Mousell, Eglantine, Leeson Park, Dublin, for "A circular drop shutter for taking instantaneous photographs."—Dated 25th July, 1884.

Specification Published during the Week.

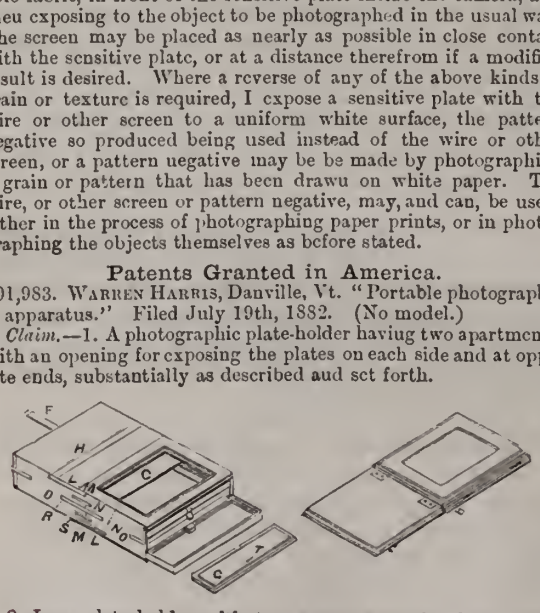
5896. ALEXANDER BORLAND, of Wilmslow, in the county of Chester, "Improvements in and apparatus for the production of photographic negatives to be used in the processes of photo-lithography, photo-zincography, photo-engraving, photo-etching, or photo-type productions." Dated 28th December, 1883. (*Provisional Protection only.*)

This invention has for its object the production of photographic negatives having suitable transparent lines, dots, or stipples so that such negatives may be used in the processes of photography, photo-zincography, photo-engraving, photo-etching, or photo-type productions, such negatives being either portraits, views of buildings, machinery, or landscape or other objects. Hitherto, the means employed in making such negatives has been to take a paper photograph, and stipple the same by hand or by impressing the same with any rough substance such as sand-paper, glass-cloth, or muslin, made hard by steeping in glue, or by fine wire gauze, and after being so impressed, filling the indentations with some kind of soft and dark pigment, and then making a negative of the same. In my process I obtain a like result by placing a screen of wire or hair gauze or perforated metal or paper or other substance having suitable perforations, or by means of a screen of muslin, net, or crape, or other suitable fabric, in front of the sensitive plate inside the camera, and then exposing to the object to be photographed in the usual way. The screen may be placed as nearly as possible in close contact with the sensitive plate, or at a distance therefrom if a modified result is desired. Where a reverse of any of the above kinds of grain or texture is required, I expose a sensitive plate with the wire or other screen to a uniform white surface, the pattern negative so produced being used instead of the wire or other screen, or a pattern negative may be be made by photographing a grain or pattern that has been drawn on white paper. The wire, or other screen or pattern negative, may, and can, be used, either in the process of photographing paper prints, or in photographing the objects themselves as before stated.

Patents Granted in America.

301,983. WARREN HARRIS, Danville, Vt. "Portable photographic apparatus." Filed July 19th, 1882. (No model.)

Claim.—1. A photographic plate-holder having two apartments, with an opening for exposing the plates on each side and at opposite ends, substantially as described and set forth.



2. In a plate-holder with two apartments, the double back with an interior space, into which the slide C may be drawn, substantially as described, and for the purpose set forth.

3. In a plate-holder with two apartments, the interior moveable partition, substantially as described and set forth.

4. The combination of slide I, levers L, P, and the moveable partition, substantially as described, and for the purpose set forth.

5. In a portable photographic apparatus for taking pictures on dry plates, the combination of folding camera-body, hinged-front, plate-holder with two apartments, openings for exposure at each end and on opposite sides, sliding partition, double plate-frames with single grooves, and with shoulders in openings, all substantially as described, and for the purposes set forth.

302,104. BARNET M. CLINEDINST, Baltimore, Md., assignor to Thomas H. McCollin, Philadelphia, Pa. "Means for mounting photographic cards." Filed March 19th, 1884. (No model).

Claim.—1. The combination of a sheet or base of card or other paper board, and flexible ears or clips, substantially such as described, adapted to be bent to clamp the edges of cards and hold them against the face of the sheet, as specified.

2. The combination, with a sheet of paper-board, of a number of flexible ears or clips arranged with relation to the sheet and with each other, as shown and described, whereby a number of cards may be clamped and held with their edges adjacent to each other for simultaneous display, substantially as described.

3. The combination, with a sheet of straw or other board, of clips of flexible material extending through said boards, adapted to be bent over the edges of cards on opposite sides of the sheet, substantially as described.

4. The combination, with a sheet of paper-board provided with a raised border, of flexible clips adapted to be bent over and to clamp the edges of cards or pictures, substantially as described.

PHOTO-ASTRONOMY AT THE RIFFEL.

BY C. RAY WOODS.

No. I.

EIGHT thousand five hundred feet above the level of the sea! Surely the clearness of the atmosphere at such a height should be almost as favourable as one could wish for astronomical work. The English climate is tantalizing enough where very delicate work has to be done, and for performing such a piece of work as photographing the solar corona without an eclipse, the glare of the atmosphere is, except on rare occasions, sufficient to overcome the comparatively faint light of the beautiful "glory" that has attracted the astronomer on occasions when the orb of day suffers a temporary extinction.

Eclipses of the sun take place at long intervals, and are extremely short in duration. Even then they are only visible over a very minute portion of the earth's surface. In the course of a century, the sun is only eclipsed for an hour or two, all told; and many efforts have therefore been made to render us independent of them. It is fourteen years now since Janssen and Lockyer independently arrived at a spectroscopic method of observing the red prominences at will, and at many European observatories observations are made of them from day to day. But the silvery light of the corona defied all efforts till Dr. Huggins considered he had succeeded in accomplishing the task by means of photography.

Dr. Huggins' first results were obtained as follows:—An image of the sun was formed by means of a reflecting telescope, and thrown into a camera. Just in front of the plate, which was well backed with asphaltum, a piece of clear blue glass, and later, a cell containing a solution of permanganate of potash, was placed. By this means all rays, except those of very high refrangibility, were cut off. The object of this was to use only that kind of light which the spectrum-photograph of the corona taken in Egypt, 1882, showed the corona chiefly to emit, the H and K lines in the ultra-violet being the strongest. The results Dr. Huggins obtained were by Captain Abney pronounced to be genuine, after he had compared them with the photographs of the 1882 corona. It was only at rare intervals that the English sky was good enough to enable Dr. Hug-

gins to prosecute his research; and in 1883, while Mr. Lawrence and myself were on Caroline Island, Dr. Huggins was only able to obtain photographs a month before and a month after the day on which the eclipse of the sun took place. When we came to compare results, the form of the corona in the Caroline Island photograph appeared to occupy a place midway between those of Dr. Huggins, a fact which favourably impressed me as to the truth of Dr. Huggins' method. It was scarcely to be expected, however, that Dr. Huggins' photographs should show the fine detail that is to be obtained during an eclipse; that they showed, though vaguely, the general form of the corona, was in itself a satisfactory result.

But it must be remarked that the results obtained by Dr. Huggins under the unfavourable climatic conditions prevailing in England were not sufficiently good and sufficiently definite to obtain the unqualified approval of scientific men. They were sufficiently good, however, to justify the expense entailed in more extended observations under more favourable conditions. Moreover, could a series extending over a short space of time be obtained, they could be of immense value in determining the nature of the corona, and possibly settle this vexed question in solar physics. As your readers already know, the Royal Society, through a committee appointed for the purpose, have entrusted me with the work.

I will endeavour briefly to describe my equipment, not as it exists now, under the tent of Willesden canvas beneath which I am writing this letter, but as it existed when I started from England. Four heavy cases contained the equatorial stand of a Greenwich photo-heliograph. Two cases contained a new instrument, a "coronagraph," constructed by Messrs. Grubb, of Dublin, and which I shall describe in detail later on. Several more packages contained the wooden frame-work for my observing-tent and dark-room, as well as the canvas and Willesden roofing necessary to cover them. Another case contained a stock of plates; yet another was full of chemicals. I brought out chiefly chloride plates, which, on account of their selective nature and sensitiveness in the ultra-violet, Dr. Huggins had found to be most suitable for his work, and which, in fact, enabled him to dispense with the blue glass or permanganate of potash solution. Altogether I had fourteen packages, weighing in all nearly a ton. These were sent by rail as far as Visp. How I was to get them from Visp to Zermatt, and thence up the Riffel, goodness only knew—I didn't! I set out, however, with as light a heart as I could under the circumstances, trusting a little in my usual good luck, and still more in the friendly offices of Herr Seiler, the well-known hotel-proprietor of "Zermatt" and the "Riffel."

It is impossible for me to refrain, here, from calling to mind a remark made by a facetious friend, as he viewed the array of packages that were gathered together in London previous to being placed in the hands of my shipping agent.

"What a sensation you'll create, old fellow! They'll take you for a German count or an English fool."

I've thought a great deal about this, and I want to know what my friend meant. I have looked several times in the glass lately, when the words have been brought to my mind, and I feel perfectly confident that I bear very little resemblance to a Teutonic nobleman.

All these things, however, had been sent on before me. My personal baggage consisted of my 7½ by 5 camera and tripod stand, two small portmanteaux containing clothing, and a large hamper containing a further stock of plates, and some few chemicals, &c., that I could not get ready previously. And here is a wrinkle for photographers about to travel. Pack all your things in portmanteaux, and, provided you do not make them heavy enough to excite suspicions of dynamite, you can register them in London as far as the Swiss frontier. My unfortunate hamper the railway company refused to register. It was examined by the Customs at Calais, and on arrival at the Swiss frontier, when a small selection of baggage was examined, my hamper attracted foremost attention. The ordeal had again to be gone through, and a duty of a franc or two on some of its contents had to be paid. On arrival at Visp, again, it was the last thing to be lifted out of the luggage van, and was unceremoniously bounced out upon the platform as the train moved off. I anxiously rushed to the rescue, and, to the astonishment of onlookers, applied my olfactory organ to it to ascertain whether the bottles containing my ether or alcohol had suffered damage. Happily, nothing was injured.

Speeding along by the lake of Geneva, by the beautiful castle of Chillon, the remarkable railway at Glion that ascends the hill with such a steep gradient, and the pretty town of Vevey, it seemed hard lines that one could not stop to take a shot or two. Had I only known that on reaching Visp I should find that my instruments had not arrived, I should have made less haste. The town of Visp offers very few subjects for the photographer, but, having to stay there for a few days, I tried my hardest to make good use of a few plates.

At last my packages arrived, and were consigned to the care of Mr. Seiler's men. The road is very narrow and very steep, but a long cart, not more than two feet wide, enabled them to be taken to Zermatt. Packing my personal baggage upon a mule, and placing my small articles and my camera upon the back of one of the native porters (as steady-going as the mules), I started on the road. Along the little road on the edge of the precipice one met occasionally with the subject of a characteristic picture. Here was a little châlet standing against the hill, there the turbulent Visp river rushing along the valley, and eddying round the rocks and stones that obstructed its course. The little village of Stalden, snugly nestling in the valley, was too good to be passed over, the spire of its little church forming a centre round which the white buildings picturesquely grouped themselves. But of natives—natives, that is to say, suitable for being incorporated in a picture—I met none. Switzerland may have its quaint costumes, but over the little part I have traversed, a road well trodden, and yet more often ridden by Europeans, I have not met with one. And if the rest of Switzerland is at all like this, they must have very few passable looking, not to say pretty, women.

At St. Nicholas the journey is broken, and from there to Zermatt the tourist usually takes a carriage, the road being good. A covered carriage was necessary on this occasion, for the weather, which had hitherto been very fine, now underwent a change for the worse. Rain fell heavily when one was not surrounded by mist which completely obstructed the view. At Zermatt, in the evening, however, clear weather again prevailed, and before retiring to rest I was greeted by a sight of the Matterhorn, unobstructed by clouds, standing out against a blue sky, and illuminated by the moon. Unique in its rocky pyramidal character, sharply chiselled as if by the hand of man, it is a sight worthy of admiration at all times; but not, as yet, have I seen it grander and more imposing than when I gazed upon it from the window of my room in the "Mont Cervin Hotel."

Next morning I was up with the lark, or whatever bird takes the place of it here. Many of my heavy packages had already been placed on the backs of mules, and were on their way up the mountain. Some of them still remained at Visp, and were to be brought up next day. But I had enough to go on with, and before the day was over was able to make a little progress in constructing my observatory. On the way up I was able to expose a plate or two. The châlets and the pine forest, the termination of the Gorner glacier, and the Matterhorn as it appeared from sundry points along the zigzag path, demanded more time and care, though, than I was then able to give them.

It took three days for all my baggage to be brought up and placed on the site I selected close to the Hotel on

the Riffel. I had to make several journies down to Zermatt, and even to take some of the heavy portions of apparatus to pieces, guarding the more delicate parts under my personal charge. When I had them all to my hand stormy weather set in, and progress was very slow. But the longest task must have an end, and I am now settled. What I have already accomplished I must leave for my next communication.

THE CAMERA AND ITS APPURTENANCES.

BY LIEUT.-COLONEL W. T. NOVERRE.

To amateur photographers the proper choice of apparatus is a matter of considerable importance, and of much difficulty to those who have not the opportunity of inspecting the various manufacturing establishments, but are obliged to depend upon the information to be obtained from catalogues and advertisements of rival manufacturers, which must considerably mystify the inexperienced, cameras and other articles of various forms and prices being recommended as excelling each other in cheapness and efficiency.

The selection of a camera is the most difficult, as it is the most expensive article in the amateur's outfit; and on its proper selection depends much of his future comfort and pleasure in working. There are many sizes and patterns to select from, and the prices vary from a guinea to twenty times that sum. Moreover, the size of the camera will rule the sizes of all the other apparatus required, as well as the sum to be expended on dry plates, chemicals, and other materials.

It may be stated that the most popular form of camera with amateurs is, without doubt, the folding bellows camera with side flaps, the invention of Mr. Meagher, who introduced the folding tail-board in 1862, and the side flaps in 1865. Its great popularity is very clearly shown from the fact that it has been copied by nearly every maker of apparatus, and takes the principal place in their catalogues. It does not, however, follow that by simply writing for a camera of this description the photographer will get the instrument best suited to his requirements, for the camera has several modifications, and in ordering a camera and enquiring the cost the particular form required must be clearly specified.

The camera in its simplest form is oblong, and has no swing-back; as pictures often require to be taken vertically as well as horizontally, a camera of this kind must be set up on its side where an upright picture has to be taken In price lists it is invariably noted that a single swing back will be charged so much extra, and a double swing-motion can be added at a further additional cost. The single swing gives the swing motion only when the camera is used in the horizontal position. A camera so constructed has no swing adjustment when the camera is turned on its side to take an upright picture, whereas it is in this description of picture that the swing-back is mostly required: yet it is surprising the number of cameras that are sent out with the single swing only. The double swing permits of the swing motion being given with the camera in either position, but it has the objection that it lessens the stability of the back portion of the camera, the attachment being on one side only of the framework.

To obviate this defect, and to overcome the inconvenience of turning the camera on its side for upright pictures, the square camera is frequently preferred. In this form of camera the slide is square, and the plates can be placed in it either way, so that a single swing-back will give the swing motion whether the plate be placed horizontally or vertically in the camera. A square camera with swing-back would seem then to be all we require, but there is an inconvenient defect in the arrangement, namely, that the plates must be placed in the slides in their proper position according to the number of horizontal and upright pictures respectively which it may be our intention to take; but we seldom have this information unless the subjects have been carefully inspected beforehand. To overcome this, the camera should be made with a reversible frame or holder; the square form of the instrument is retained, but the slides are made oblong, and by means of the moveable frame can be placed in the camera either in the horizontal or vertical position. A saving, too, in the size and weight of the slides is gained, which are similar in size to those used in an oblong camera. The camera under notice is made square with single swing-back, and provided with a reversible frame is probably the most perfect form of portable camera in the market. The bulk and weight is greater than that of an oblong camera, and the price is higher, especially when compared with the price of an oblong camera without swing-back; this latter description of camera will answer perfectly well for the ordinary work of an amateur photographer, while it has the advantage of being less bulky, lighter, and cheaper. The only case in which a swing-back is likely to be required is in photographing high buildings, when the camera has to be considerably tilted: for buildings of ordinary height, such as usually come into a country view, the swing-back may be dispensed with, and, indeed, is better out of the way. There are two or three ways of attaching the swing-back, depending chiefly on the size of the camera, and the extent to which the purchaser is prepared to sacrifice rigidity to portability. The expense will be about the same whichever method is adopted.

Nearly all camera-fronts are made to rise and fall, so as to bring more or less of the foreground or sky into the picture without tilting the camera. The lens flange is screwed to the rising front, and if you possess two or three lenses, a front is ordinarily required for each lens; but there is an improved form in which a small panel takes in and out of the sliding front, and to this panel the lens flange is screwed, a panel being required for each lens. A neater plan is to have the sliding front fitted with the flange of your largest lens, and to have brass adapters to take the smaller lenses. An objection to this is that if you purchase a new lens, the adapters require alteration. The camera should be provided with a strap-handle to carry it by, and for raising it out of its box or leather case. For some reason this is rarely added by makers of cameras. Another useful adjunct to the camera is a small spirit level; it may be let into the base-board behind. A small dial indicator to show which plates have been exposed, attached to the body of the camera, would be valuable, and an arrangement for telling when the centre object is in the centre of the plate will be found very useful. All that is necessary is a small piece of brass plate with a V-shaped notch cut on the upper edge. This is screwed on the back frame of the camera, and a small pin is fixed on the front, both being in the centre, and resembling the fore-sight and back-sight of a rifle; the contrivance is specially useful in photographing animals or moving objects, as it enables you to see at the last moment that the object is properly centred, and to adjust the camera, if necessary, without recourse to the focussing-screen.

The focal length of the camera, or the distance from the lens to the focussing screen, requires attention. Ordinarily the amateur will be contented to use the lens which is made to cover the sized plate he has selected to use. In this case he will find the camera as usually made is sufficiently long, but it has been pointed out that a given subject can often be taken to greater advantage when a longer focus lens is employed than is necessary to cover the plate. The effect of thus using a large lens to cover a small plate is that a smaller angle of view is included; or, in other words, in place of having a large amount of view on a small scale, we get a small amount of view on a large scale. The same object may sometimes be gained by placing the camera nearer the subject, but very often in landscape work this is impracticable, besides having other objections. If it is intended to use extra long focus lenses, the camera-maker should be informed, that he may construct the camera accordingly.

THE ITINERANT PAINTER.

BY H. P. ROBINSON.

When a well-established photographer takes a portrait, he looks for his profit, not only to the sum he receives for the first order for copies, but to the contingent potentialities which may arise from the possession of the negatives, and to that end he goes to a great deal of trouble and expense in cataloguing and storing them. Of course the great proportion of these negatives are never wanted again, and are an incumbrance; but all professional photographers know that there is so good a demand for copies from old negatives, that they find it to their interest to keep all they take, and to print prominently on the back of their cards, "All negatives are preserved. Copies or enlargements of this portrait can always be had." Talking on this subject the other day to a photographer, he said, pointing to a beautifully-finished enlargement, "Here is an instance. One day, some years ago, a shabby old gentleman came into the reception-room, and said he wanted his portrait taken. He was shown specimens, but he said they were all too dear; he could only afford half-a-guinea, and if I liked to do it for that sum, he should be glad to have it done. I liked the appearance of the old man, who looked poor but respectable, so as a kind of charity I took a negative of him. I was so pleased with him, that I offered to send him a dozen copies without charge, but he would not accept this offer, saying he had to drive a bargain sometimes, but he could pay his way, and paid his half-guinea. I found afterwards I had entertained an Angel—a business Angel—unawares, for I have done nearly £300 from that negative since. The fine old gentleman died soon afterwards, and then I found he was a famous manufacturer, and that the portrait I had taken had a peculiar expression in the eyes of his friends, that had never been got before in any portrait he had had taken, and the orders for enlargements poured in, and still continue." This is, of course, an extreme instance of the value of a kept negative; but "back orders," as they are sometimes called, are so constant that many photographers who keep careful statistics of their business can tell to a few pounds how much their old negatives will bring in every year. Then they constitute one of the bases on which businesses are valued—in short, they are property.

It is a constant complaint of photographers that they are always open to, or suffering from, the attacks of those who want to rob them of this property. There is a class of people who misuse the great name of artist—as, indeed, for the matter of that, some photographers do, by applying it to themselves—who go round the country, and by means of introduction or impudence, obtain orders for portraits, usually enlargements painted from photographs. As they never take an original portrait themselves, they require the negative, and use every means, fair or foul, to obtain it, and are usually successful. The method of proceeding is something like this. The father of a family has been dead a short time, the itinerant hears of this, and before she has had time to apply to a photographer, gets an introduction to the widow. A great part of his success in his business depends on fluent and persuasive speaking, and the lady is soon induced to order a portrait of her late husband. And some of the "tramps" are so pressing and plausible that they compel orders against the will, or certainly against the calmer reason, of their victims. When the order is booked, they ask to see a portrait of the husband, and take down the name of the photographer. They usually get the widow to write for the loan of the negative, taking great care to explain that no injury shall happen to it, and that he is sure the photographer will be delighted to lend it to a brother artist, especially as it is of no further use to himself. Perhaps the photographer reluctantly consents, seeing no way out of it, or he more properly and wisely refuses to lend the negative. In this case the itinerant brings more pressure to bear, showing to his patron how selfish and inconsiderate the photographer is in preventing her having a splendid portrait of her husband now there is such a fine opportunity. The result is that the unfortunate photographer is placed on the horns of a dilemma: if he consent to lend the negative, he loses the benefits for which he has speculatively kept it for years; and if he refuse, he runs the risk of losing an old and good customer.

There are grades, even in this low class of art. There is the "perfect gentleman"—of that class of gentlemen who are never seen without their gloves—who selects a suitable town and takes a good house or grand apartments, and works all the country round. This is one of the princes of the profession who occasionally gets as much as £100 for a picture. This practitioner can afford, and often does pay, the photographer for the use of a negative, but he oftener induces him to join him in risky practices that are certain to bring him into disrepute with his patrons. For instance, amongst the photographer's specimens he will see a fine-looking man or a beautiful woman, and, first ascertaining if the game is worth the candle—that is, if their proposed victim is rich and amiable, or able to pay and timid. He then paints his picture, sends it to the victim beautifully framed, explaining as his reason for painting it that the head was so fine that he really could not help trying to do it justice, and he thinks he has succeeded. No mention of price is made in this first experiment. He probably gets it back with a letter of thanks, and a civil word or two about it being very well done, &c. Then begins a series of puttings on the screw, running sometimes at the last to the most unscrupulous proceedings, until the victim succumbs—and pays. It is astonishing what a quantity of orders these men will get, until at last they make the town too hot to hold them, and move on to another.

These itinerant painters are not all of the male persuasion; a good many are ladies, ranging from the old miniature painter—the Miss La Creevey's are not yet extinct—down through students who have failed in original art, to the merest tinters. I hear of them from all quarters, and am often requested to give advice as to what is the best manner of treating them. This is very difficult to give; different circumstances require different treatment, but in most cases the best policy would be to refuse to have anything to do with the poachers. It should be easy to explain to a client that a photographer ought not to be expected to give up the fruits of his foresight and care, that he could scarcely afford to warehouse negatives for the benefit of others, and, above all—and he must show this—that he can produce as good a picture as the itinerant at the same price.

Whether one photographer should occasionally lend a negative to another is quite a different question. I am inclined to think there are many occasions when they should oblige one another—it may be for their reciprocal advantage; but I can see nothing to be gained by encouraging those who prowl about the country trying to get work out of the hands of those to whom it legitimately belongs.

Correspondence.

VOGEL'S METHOD OF COLOUR PHOTOGRAPHY.

Sir,—Under this title I find, in the Journal of the Photographic Society, June 27, p. 151, the following remarks:—

Vogel's Method of Colour Photography.—In our last issue we gave extracts of Dr. Vogel's experiments in rendering different colours in their proper gradations, and it seems that this was brought about by using eosine, or some dye very similar to it, with an excess of silver nitrate. In 1876 the Editor of this journal made a communication to the Photographic News, in which the following experiment was described:—"An emulsion of eosine with excess of silver it was endeavoured to form in the ordinary way, a calculation having been made, which subsequently

was corrected by experiment as to the amount of silver necessary. The addition of silver nitrate to the eosine showed that a combination had taken place, for fluorescence was annihilated, and a crimson colour resulted. An emulsion at first formed, but finally nearly totally dissolved in the solvents of the collodion; but after coating a plate with it and drying it, no crystallization was apparent, and on exposing it a feeble image was obtained. . . . . A plate coated with emulsion and this 'collodio-eosine' and silver gave a picture of the spectrum extending from the blue to a line below A. We may state that the intensest part was in the green." On January 9th, 1878, Dr. Robert Amory presented to the American Academy a "Memoir on the Theory of Absorption-bands in the Spectrum, and its bearing in Photography and Chemistry." After alluding to the above quoted paragraph, Dr. Amory goes on to show that he obtained a picture on pure eoside of silver, in which the action of the spectrum was united to a part of the spectrum from below D (the orange) to above F in the blue-green. A short time after that Dr. Amory forwarded to us a plate showing this, in which he had used a grating spectrum, and where the local sensitiveness of the "eoside of silver" had enabled him to photograph with the third order between the above indicated limits, without any impression being made by the blue rays. Here, then, was a salt which, if judiciously mixed with ordinary sensitive salts, Dr. Amory showed was capable of producing the effect which Dr. Vogel has done. Later still, and only some two years ago, Professor Rowland stained his bath collodion films with eosine to photograph the same region, and we have by us exquisite examples of the spectrum in the orange-green region executed by this method.

In March of this year the Editor demonstrated at the Royal Institution that the yellow of a colour chart could be made as photographically intense as the blue, and indeed more intense, by using cyanine blue. This was shown in reference to Dr. Vogel's experiments made in 1874. Thus we see that though Dr. Vogel may have worked out the process further than others, yet as regards eosine he is not in advance of other experimenters. Dr. Amory perhaps can claim the highest credit in this particular branch of the research, though to Dr. Vogel undoubtedly, in 1874, belongs the credit of having first called attention to the action of the dyes in general. We have thought it right to give this slight historical sketch.

I beg to say, with respect to this note, that I have never claimed to have been the first who has worked with eosine; on the contrary, I have mentioned the earlier trials with this substance made by other investigators, especially Waterhouse, who was the first who worked with eosine. If I have not mentioned the investigations of Abney and Amory, regarding eoside of silver, the reason is that I did not know them.

I agree now the eoside of silver was known before me, but I mention that my intention was not the study of eoside of silver *per se*, or only its behaviour in the sun spectrum. I made experiments with wet and dry collodion plates, dyed with eosine, and also with dry gelatine plates, and I observed that in the wet collodion process eosine gave the best results. It has the highest sensitiveness for yellow and green rays (PHOTOGRAPHIC NEWS, May 23, page 325), and I asked, "But why is this?" (*ibid*) This question I have answered by my researches, and I pointed out that the formation of eoside of silver is the reason why eosine works better in wet plates than in dry ones.

Nobody before me has answered the above-mentioned question in the way I did. On the other hand, I have shown the importance of such dyes (for photographing coloured rays) as give silver compounds like the eoside. I pointed out the fact that there are other derivates of eosine—*i. e.*, cyanosin (the methylated eosine)—whose absorption bands are situated more towards the red end of the spectrum, and which are, therefore, more favourable for taking red colours than the ordinary eosine.

Captain Abney says in the above notice that he has demonstrated in March of this year, at the Royal Institution, "that the yellow of a colour chart could be made as photographically intense as the blue, and, indeed, more intense, by using cyanine blue." I highly esteem the works of such an eminent investigator as Captain Abney, but I beg to remark that I showed on the 21st of March, in the Berlin Society for the Advancement of Photography, the first results of my practical process for taking colours in the right proportion of their brightness (*Photographische Mittheilungen*, xxi., p. 6), the action of the yellow being far more intense than the blue, a process rewarded with the prize of honour by the Society, and worked out now practically in German studios for reproduction.

H. W. VOGEL, PH. DR.

STRIPPING GELATINE FILMS BY MEANS OF HYDROFLUORIC ACID.

SIR,—The method of stripping a gelatine film described on the 25th inst. seems complicated. I do it in a much simpler manner.

Take a developing tray larger than the negative to be stripped, pour in sufficient water to cover, and, for a whole-plate, drop in eight or ten drops of hydrofluoric acid (the exact quantity cannot be given, as the strength of the acid is constantly diminishing, though kept in a gutta-percha bottle), place the negative in the acidulated water, and in a minute or two the film will frill all round the edges and gradually leave the glass. If the operation is slow, add two or three more drops of acid, and gently rock.

When the film is loose, hold it at one end and pour off the acid water, and wash by repeated changes of water; this lengthens the film wonderfully, but if the last washing is done with equal parts of methylated spirits and water, it will return to its original size. This may be varied considerably by using more or less spirit. But on no account should undiluted spirit be used, as it makes the film coil out of all control.

Clean a plate with nitric acid—larger than the stripped film—dust with French chalk, polish with a dry cloth, and with a wet one wipe a quarter of an inch all round, coat with plain collodion, and when set, or even quite dry, introduce under the film. Adjust the film, and with a little care there will be no bubbles. Allow the film to dry, and coat with plain collodion. When this is dry, run a sharp penknife three-eighths of an inch from edge of plate, and you have the gelatine film between two collodion films, impervious to moisture, quite flat, and may be printed from either side. The acid is so dilute that any developing tray may be used. CERAMIC.

THE LAW OF IMPLIED GUARANTEE.

SIR,—In your paper of the 25th inst., the case of Turner *v.* Ermen is referred to, and the plaintiff is said to have gained his case because "a trace of fatty matter, well known to be injurious to rubber," was contained in the thread supplied by the defendants. This is not correct. The statement of case settled by the *Arbitrator* says on this point:—"Upon experiments being made during the hearing of the case, it was ascertained that the injury was caused solely by the chemical action of certain ingredients used in the processes of dyeing and sizing, but it was not a previously known fact that the said ingredients, either alone or in combination, would produce such chemical action." The decision of the court (Justices Field and Watkin Williams) was for the plaintiff. An appeal was strongly urged upon defendants by their counsel, but the matter was settled by compromise. We do not think the case is one which furnishes a trustworthy precedent.—Yours faithfully, ERMEN AND ROBY.

Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE first outdoor meeting of the season was held at Hampstead Heath on Saturday last, the 26th inst.; the tea at the "Bull and Bush," which followed a pleasant ramble on the Heath, being the main feature of the gathering. Mr. W. ACKLAND occupied the

seat at the head of the table, and Mr. W. Brooks took the vice-chair.

The loss sustained by the Society by the death of the Rev. F. F. Statham was referred to by the chairman, who also made some remarks regarding the agreeable and non-formal character of the outdoor gatherings—not very photographic it is true, as a camera is but rarely seen—the members of the Society being glad to cast away the remembrance of the studio and dark-room, and spend a few hours in genial conversation.

Shortly after nine o'clock the gathering broke up, but the heavy rain which had set in served rather to mar the prospects of a pleasant journey home, especially for some members who had a ten or twelve-mile tricycle ride before them.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 24th ultimo, the chair being occupied by Mr. J. H. Hare.

Mr. A. Cowan showed a method of cutting circles in ebonite, vulcanized fibre, and similar hard substances, wherein he employed a pair of fixed compasses, bent about two inches from the points to form an arc of a circle; one point forged to a graver edge formed the cutting tool, and either the compass or work could be moved as required. Circles ranging from half-an-inch to nine inches in diameter might be easily cut in this manner.

The Chairman considered the edges much cleaner than those produced by Mr. Ayres at the previous meeting.

Mr. H. S. Starnes exhibited his camera and changing-box combined, a description of which will be found on page 431 of the volume for 1882. He also showed strips of zinc grooving suitable for metal plate-boxes, made by passing strips of zinc between cog-wheels.

The Secretary had recommended the use of cog-wheels for that purpose some time ago; he found it necessary to use wheels having deeply-cut cogs.

A communication was read enquiring the best mode of parchmentizing paper.

Mr. Sutton said a very good paper was imported from Japan, in thicknesses varying from thin tissue to that of cardboard; he believed it was made from mulberry leaves, and would obtain examples in time for the next meeting.

The Chairman remarked that the querist was desirous of ascertaining the best method of parchmentizing paper. Had any one tried the proportions of acid and water that Mr. Ashman recommended on the last occasion?

Mr. J. Barker said the strength of the paper had to be considered; he had recently made some, using equal parts of acid and water, immersing ten minutes, and washing very thoroughly.

Mr. J. B. B. Wellington showed how a weak solution of ferricyanide of potassium and hypo will clear away green fog when the solutions are too weak to reduce the density of the image. In the example shown, portions of a green fogged and under-exposed negative were cleared in a most perfect manner.

Mr. W. M. Ashman had noticed, when using the solutions stronger for reducing purposes, that any green fog was quickly changed to grey.

Mr. W. Cobb mentioned that some new dark slides just made with leather hinges had hopelessly fogged a lot of his plates. After coating the leather with alcoholic solution of thymol, and exposing them to sun-light for a few days, the evil ceased.

Mr. Cowan said Mr. Cobb's was not the only case; he was shown a plate with an insensitive band two inches broad, supposed to be caused by American-cloth.

The Chairman considered it very important, seeing that most camera-makers employ leather hinges. He should be more inclined to blame the composition used in attaching the leather to the wood.

Mr. Cowan referred to an experience of their late member, Mr. C. G. Collins, who observed an effect on plates when the interior of the slide was painted with an oily medium, but not with vegetable black and spirit varnish.

Mr. Barker agreed with the Chairman; he doubted whether leather would cause markings; it might be light entering the camera or slide.

Mr. Riemann enquired if sulphite of soda had been found to develop an image without the addition of another alkali.

Mr. W. E. Debenham remarked that most samples of sulphite of soda contain carbonate, which is sufficiently alkaline to set up developing action.

Mr. W. Coles thought it was stated in the article just quoted that neutral as well as ordinary commercial sulphite of soda was used, whereas the same amount of alkali as found in the ordinary sample gave fog.

Mr. Barker looked upon it as another illustration of of a retarder being also a developer. Either tannin or coffee would develop a gelatine plate, provided sufficient exposure be given.

A letter from Mr. Crosby was read, stating that he had arranged to publish his formula for producing gelatino-chloride opals shortly in the Photographic News, therefore could not comply with the Secretary's request.

Much interest seemed to be shown in this class of picture, several members signifying their intention to try to obtain a plate which will keep well.

Mr. Ashman showed an opal of rich purple brown tone made according to the formula given last week, except that he boiled ten minutes, employing a high temperature for mixing and digesting; he also pased round an opal somewhat bluer in tone, which had been produced by Mr. Offord some time ago, who had no difficulty in obtaining any colour he desired.

Talk in the Studio.

The International Exhibition at the Crystal Palace.—Last week we announced the award of a silver medal to Mr. Horatio Nelson King for his photographs in the fine art section of the Exhibition, and we pointed out that the award was the only one made in this section for photography, the judges in this case being artists of well-known repute. Some photographic exhibits were displayed (for what reason we cannot tell) in Section IV., and these pictures were adjudicated on by the gentlemen charged to report on educational works and apparatus, printing, stationery, book-binding, painting and drawing materials, &c., while the fine art section had, as before mentioned, its special jury of artists. The collection of photographs in Section IV. is, however, a very small one, and the exhibits are so scattered about the building as to be difficult to find; but some good work is shown, and the report of the jury shows that Messrs. Baudaux and Son, of Jersey, are awarded a gold medal "for artistic and technical excellence of photographs printed in carbon," and the frames exhibited contain numerous and meritorious examples of portraiture and of carbon transparencies. Mr. Robt. Faulkner has a silver medal for "children's portraits"; and M. Eugène Pirou, of Paris, is similarly honoured. We noticed that M. Pirou's photographs were, perhaps, a little "retouched," but the lighting is excellent, the pose artistic, and the expression characterized by a happy and natural ease. An award of a silver medal has also been made to Messrs. Hunter and Sands "for excellence of workmanship and ingenuity of construction of photographic cameras and apparatus." It is to be regretted that all the photographs were not placed together in the fine art section.

A Vitreous Coating or Enamel for Medals.—The following is said to form a good enamel for cast iron, wrought iron, or steel, and we are informed that it will not crack on being subjected to moderate changes of temperature. When an opaque enamel is required, let us suppose as a basis for vitrified photographs, about 8 parts of oxide of tin should be added. Take about 125 parts (by weight) of ordinary flint glass fragments, 20 parts of carbonate of soda, and 12 parts of boracic acid, and melt. Pour the fused mass out on some cold surface, as of stone or metal, and pulverise when cooled off. Make a mixture of this powder with silicate of soda of 50° B. With this coat the metal to be glazed, and heat in a muffle or other furnace until it is fused.

The Stereoscope.—Professor Himes, of Dickenson College, Carlisle, Pennsylvania, has published a handbook of the stereoscope, in which he gives much useful information. It seems strange that an instrument once so popular is now so little used. Indeed, it may be said that the making of stereoscopic slides is hardly a branch of photographic industry at the present time. The notes on the selection of a stereoscope are worth reproducing. Since the lenses, as a rule, in the instruments exposed for sale are not adjustable in a horizontal direction, and have consequently in case of each instrument a fixed deflecting power, it is well to see that their distance from each other is such that they will cause the pictures of the average sized stereograph to unite readily for the person who is mainly to employ it, or for persons whose eyes are the average distance apart, otherwise the lenses, if too near, will not cause the picture to overlap, or if too far apart will cause them to overlap too much—in either case

the work left for the eyes to do has a tendency to cause fatigue. . . . . This may be most readily ascertained by simply drawing two vertical lines, about ½ inch long 2¾ inches from each other, on a card (the back of a stereograph will answer), and placing it in the stereoscope, and observing how readily, or how nearly, the lines are superposed at first glance. If a series of such lines, different distances apart, are drawn on different cards, and placed in the instrument one after another, and looked at for an instant, the separation of the pictures for which that instrument is best adapted will soon be recognised.

FATAL FIRE AT A PHOTOGRAPHER'S.—About half-past eleven on Friday night, the 25th ult., a fire broke out at 78, High Road, Lee, a hair-dresser's, with a studio attached. The whole of the premises, consisting of the studio, shop, and seven rooms, were covered by the fire, and were in the end totally gutted. Two men were sleeping on the premises, and one of them, Richard Lensley, jumped from the second floor to the ground, but escaped uninjured. The fire gained so rapidly that it was impossible to save the other man, an Italian named Francisco, whose charred remains were found at three o'clock by Engineer Bradley. Very extensive damage was occasioned at the adjoining shops, Nos. 80 and 76, by the same fire.

PHOTOGRAPHIC CLUB.—At the next meeting, on August 6th, the adjourned discussion on the "Effect of Colour-media on Silver Prints," will take place. On Bank Holiday, an outing has been arranged to Watford, meeting at Watford Station at 10.47; train leaves Euston at 10.15; afterwards meeting at the Essex Arms.

To Correspondents.

*** We cannot undertake to return rejected communications.

J. PENNINGTON.—A very good way of packing your exposed plates is to tie them in bundles, the films being face to face with a cardboard rim between each pair; the outside of the rims should be of the exact size of the plates, and a width of three-sixteenths of an inch is enough. Of course sufficient opaque paper must be used to protect the plates from light, and the old wrappings will come in for this purpose. An external covering of tin or lead foil is useful as a protection against damp or sea-air.

J. H. P.—1. We are pleased with the group, and think, if you continue to work hard, you will produce some very fine pictures. The only fault we can find is that the figures are arranged a little too symmetrically, and without any balancing object. Try again with the same models, and send us the result. 2. We would suggest "The Story Teller" as a title, and think it would be well to register it; but until you get a series of studies, you will find it difficult to make any money by them.

EMULSION.—1. We rather doubt whether it will give No. 25; indeed, we hardly think it will, and are inclined to think that the older method referred to is better, and will give a more sensitive product. No iodide is used in the more recent method. 2. We take it that if it is nearly neutral—that is to say, either *very faintly alkaline, or very faintly acid*—the conditions are fulfilled; but we should prefer acidity of the two. About one-tenth of the whole quantity of gelatine. 3. The gentleman referred to is mistaken, if we may judge by the results of our own experiments. 4. It should be added just before the final filtration of the emulsion, and a temperature of 120° Fahrenheit, and not too hot for keeping it while the work of coating is going on.

A. A. CAMPBELL SWINTON.—The best account is to be found in Watts' Dictionary of Chemistry.

J. HOLME.—Next week.

H. HOWARD.—1. We should recommend rather more glass, as it is occasionally useful, and it is very easy to block out with suitable blinds. 2. As regards the blocking out of the side light, it does not seem to us that you would be in any worse position than very many of the first-class photographers; but if you could manage to make the whole building a couple of feet higher from the ground line, there should be no fear whatever as to the result.

LUSSAC SMITH.—We quite agree with you that tin dishes are often very convenient for use in developing dry plates, but it seems to us that ebonite is to be preferred on the whole.

G. B.—We think you can obtain it from Hopkin and Williams, of Cross Street, Hatton Garden, London; but perhaps it will be more convenient for you to prepare it yourself. For this purpose dissolve about a quarter of an ounce of nitrate of silver in four ounces of hot water, and add a warm solution of oxalate of ammonium until no further precipitation takes place. Collect on a filter, wash, and dry at a gentle heat. These operations must be performed in the dark room.

JOSEPH TAYLOR.—Soak good glue in water till quite soft, melt it in the water bath, and stir in a sufficient quantity of methylated spirit to make it tolerably fluid, adding a little more water if necessary.

J. H. B.—We cannot tell unless you describe the instrument, as we believe the optician named is still manufacturing excellent lenses. A rough sectional diagram will be best.

E. M. R.—You had better have nothing whatever to do with any of the advertised "methods" of colouring photographs, unless you wish to lose money and time. There is scarcely any market for the sale of such coloured photographs as you refer to. We will try to find some number of the PHOTOGRAPHIC NEWS containing information useful to you.

THOMAS STOWER.—1. We should prefer to use a mixture of starch paste and lamp-black, as the preparation you mention might be expected to injure the films in the course of a few weeks, especially during hot weather. 2. The formula generally prescribes it dry; but you need not dry it if you bear in mind that the crystals contain about 60 per cent of water.

The Photographic News Registry.

Employment Wanted.

Artist & Operator.—W. F., 90, Chesterton-rd., Notting-hill.
Amateur for Instruction.—G. P., *Photo. News* Office.
Operator & Retoucher or Assistant.—E. S. T., 14, Lancaster-st., Hyde Park.
Operator in Ceramic Enamels.—W. G., 163, Park-rd., Barnsley.
Assistant Operator & Retoucher.—B., c/o F. York, Notting-hill.
Managing Printer.—Photo, *Photo News* Office.
Negative Retoucher.—T. G., 2, Hallam-st., Westbourne-ter., N.

Employment Offered.

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Lady for Reception-Room, &c.—W. J. Suter, Cheltenham.
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Retoucher & Operator.—Charles F. Treble, 371A, Brixton-rd.
Oper. & Retoucher (first-class).—T. Williams, Talbot-pl., Wolverhampton
Young Lady for Recep. Room.—T. Williams, Talbot-pl., Wolverhampton.
Outdoor Operators (4).—Berlin Photo. Co., 160, Victoria-rd., Aldershot.

Photographs Registered.

R. H. FLAMANK (Aston, Birmingham)—Photo. of Right Hon. W. E. Gladstone's Speech on Franchise Bill.
McKaw & Son, Photo. of Mr. H. M. Richardson.
T. ERWIN (Ballymena, Ireland)—2 Photos. of Rev. W. J. McCaughn.
W. GARVIE (Aberdeen)—53 Photos. of Designs.
A. MCDONALD (Penrith)—Photo. of Mr. Savage, of Bolton; Photo. of Mrs. Savage, of Bolton.
R. SLINGSBY (Lincoln)—Photo. entitled "Torksey Ned"; Photo. of Woman with Milk-pail and Stool; Photo. of Man in Boat putting to Sea.
GRAVIE—Photo. of Chimney-piece.
WINTER & SON (Hull)—Photo. of H.M.S. "Orlando."
B. R. LEECH (Macclesfield)—2 Photos. of Mr. C. Brocklehurst.
NORMAN MACBETH (Edinboro')—Design for Diploma of Membership of Edinboro' Photo. Club.
G. NESBITT (Bournemouth)—2 Photos. of Little Child.
ADAMS & SCANLAN (Southampton)—2 Photos. of Madame Lezard; Photo. of Madame Burlow; Photo. of Madame Onger.
WALTER SACH (Tunbridge Wells)—2 Photos. of the late Sir C. W. Siemens.
W. H. FRANKLIN (Deal)—Photo. of Earl Sydney.
W. BLACKALL (Folkestone)—4 Photos. of Marquis Tseng.
J. ANDREWS (Swansea)—2 Photos. of Mr. E. A. Daniell, Mayor of Swansea.
J. W. HATCH (Slough)—Photo. of Duke of Buckingham planting a beech tree at Burnham Beeches.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1353.—*August* 8, 1884.

CONTENTS

THE BEHAVIOUR OF GELATINE PLATES AT A HIGH TEMPERATURE.

NOT very many weeks ago we recorded Abney's experiments, in which he demonstrated that a gelatino-bromide plate is more sensitive to light when warmed, and less sensitive when cooled (pages 296 and 306), and it is interesting to notice the observations of Herr V. Schumann in the same direction. Schumann had his attention called to the matter by noticing that some plates, which had been considerably heated during the drying, were fogged by an exposure to the dark room lantern, which was insufficient to produce a sensible effect on normal plates; and, in addition to this, he found that the films of those gelatine plates which had been exposed to a high temperature in the drying box had become so brittle as to make it easier to cut them with the diamond than is the case with ordinary plates. At the time Schumann made these observations, he was not aware of Abney's prior experiments.

Herr Schumann next proceeded to expose corresponding plates—one warm and the other cold—to the solar spectrum, and to the spectrum of burning magnesium, Stolze's potash developer being used, and he found that the sensitiveness for both ends of the solar spectrum was very notably increased; while, in the case of the magnesium spectrum, the gain in sensitiveness was most notable in the blue-green and in the beginning of the ultra-violet. The delineation of the magnesium lines was much more satisfactory on the warmed plate; and the experimenter says that he has seldom taken the B group of magnesium lines as perfectly as on the warmed plate.

During the exposure the warmed plate was supported on a slightly concave metal block, which itself was kept warm by means of a spirit lamp. Under these circumstances the corners were somewhat over-heated, and a partial reduction of the haloid salt was noticeable, showing that heat has an action which is more or less analogous with that of light.

Subsequent experiments were made at known temperatures, and it was found that a plate heated for ten minutes to a temperature of 130° Centigrade fogged completely on the application of the developer; but, in another case, when the heat only reached 105° or 110° Centigrade, a plate (exposed hot) gave a clear and unfogged image of the spectrum, the gain in sensitiveness being very notable. In the case of similar plates which had been heated for five minutes to 110° Centigrade, and *cooled* before exposure, a certain gain was noticeable as regards sensitiveness, but this was far less than in the case of the plate exposed hot.

Whether there will be any practical gain in heating plates to a temperature somewhat over the boiling point of water before using them is a matter which practical experience can alone determine; but that the gelatine film will be less subject to deterioration from accidental chemical action if thoroughly dried, no one can doubt, and the above-described experiments indicate that it is rather desirable than otherwise to increase the temperature in the drying-box before removing the plates. Interesting results may be expected to follow the further elucidation of the subject.

PHOTOGRAPHY AT THE CITY AND GUILDS' EXAMINATION.

TAKING the results of the whole work of the City and Guilds of London Institute for the Advancement of Technical Education, one must confess that they have fallen short of expectation when viewed in comparison with the system at many Polytechnical Schools in Germany; but it is hardly reasonable to expect a new organization to work as smoothly as a system which has grown up with a people, and has, by a process akin to that of natural selection, become adapted to the spirit and wants of the community. It is, however, very satisfactory to know that the photographic department stands out prominently as one of the most successful branches of the work of the Institute.

Captain Abney's report on the examination of last May is now in our hands, and the following extract indicates that he is satisfied with the progress made since last year. He says:—

"In forwarding the results of the last examination in photography to you, I wish to draw attention to the still improving character of the answers which is to be found in the papers of those candidates who have been systematically taught. Nearly every Honours paper sent in is highly creditable, and some are excellent, as showing an extent of reading and practical work which, in the early days of these examinations, was conspicuous (except in some few instances) by its absence."

We find that 61 candidates entered for the examination,* and of these 37 passed. Of the passes, ten were in the Honours grade, and twenty-seven in the Ordinary grade; while of the failures, 39 per cent. were pupils taught by certified teachers, and 40 per cent. were pupils taught independently, or who qualified themselves by private study.

The following is a list of the successful candidates as given officially, and arranged alphabetically, although we only find thirty-four out of the thirty-seven.

Abbott, George Pearce, ordinary grade (second class).
Ashman, William Middleton, honours grade (first class).
Ayling, Joseph James, ordinary grade (second class).
Ballard, Edmund George, ordinary grade (second class).
Beeson, Francis Thomas, ordinary grade (second class), and second prize of £3, and bronze medal.

* For the questions see page 348.

Bowen, Alfred Walter, honours grade (second class).
Cartwright, John, honours grade (second class).
Chambers, Henry, ordinary grade (second class).
Coles, William, honours grade (first class), and first prize of £5 and silver medal.
Colls, Walter L., ordinary grade (second class).
Cotou, Charles, ordinary grade (second class).
Davies, George F., honours grade (first class), also second prize of £5 and bronze medal.
Dixon, Thomas James, ordinary grade (second class).
Dugon, Frank, ordinary grade (second class).
Gamble, Charles William, ordiuary grade (first class).
Gover, Herbert James, honours grade (second class).
Gray, William Edward, ordinary grade (first class), and first prize of £3 and silver medal.
Hare, Elizabeth Luey, ordinary grade (first class), and second prize of £2 and bronze medal.
Hare, Emily, ordinary grade (second class).
Hayward, Wyatt, ordinary grade (first class).
Ingle, Herbert, honours grade (first class).
Lowndes, Alfred Barry, ordinary grade (second class).
Lynes, George, honours grade (first class).
Nicholas, William, ordinary grade (second class).
Parsons, Harry S., ordinary grade (first class).
Porter, William, ordinary grade (first class), and fifth prize of bronze medal.
Rainey, Herbert Titus, ordinary grade (second class).
Smith, James Johnson, ordinary grade (second class).
Spencer, Ernest, ordinary grade (first class).
Spurge, James Blewitt, honours grade (second class).
Velasco, Frederick A., ordinary grade (first class); also fourth prize of £1 and bronze medal.
Watson, George, ordinary grade (second class).
White, Harry E., ordinary grade (second class).
Winks, Benjamin Foulkes, honours grade (first class).

The distribution of prizes will not take place till December next.

By-the-Bye.

PROGRESS IN LANTERN MATTERS.

One may learn something by looking back upon the gradual improvements of the lanteru as a scientific instrument, and tracing some of the steps in its progress. If we are to believe all that is said iu a recent number of a Philadelphia paper termed *The Exhibitor*, we owe every one of these steps to Philadelphia. She "discovered and perfected" the oxy-hydrogen light, and "her inventions" are copied by the European opticians, who are able to do but little else! We certainly do owe to America the Sciopticon pattern of body, which has its uses and advantages; but this is uot what our best lanteruists use.

Putting aside all this "brag," the historical development of the lanteru is really interestiug, aud we were looking with attentiou the other day at the first genuine exhibitor's lautern we ever possessed. This, the possession of which we acquired about the age of fourteen, was one of the pair (for dissolving views) which had actually been used by a professional lecturer who discoursed upon Australia. With the aid of these, aud an entertainment magniloquently termed a "panorama," he had amassed a competence, the greater part of which, we regret to say, he afterwards lost through speculating in a real panorama, which, later on, he too ambitiously substituted for the lantern show. The lanterns he used were by Carpeuter aud Westley, the best house then in the lantern trade. These opticians had almost a monopoly of the best goods for years, aud it seems a wonder that they ever allowed other houses to so completely take the lead in popularising the lantern. The condensers were a shade over three inches, both lenses bi-convex, the objective being a pair of single meniscus leuses; the lamp a "solarized" Argand, burning either sperm oil or Russian tallow.

Yet these lauterns did really good work, and were used successfully in large rooms ou a ten-feet disc. We saw it done, repeatedly. The curves of the objective were calculated with care, and they were large—at least 2¼-inches diameter. This is necessary to use all the light from any spreading source, such as a flame; a small objective will transmit most of the light from a lime, but it is easily shown by diagram that from a larger light the rays must spread more, and that a larger lens is needed to use the light to advantage. Aud the slides being hand-painted, were all very transparent, which makes a wonderful difference.

As to the matter of slides, better ones have never been produced than the best class produced then by Polytechnic artists; but of the cheaper class of painted slides it is difficult now to say much that is appreciative. Carpenter and Westley supplied what were considered superior goods of this cheap class, and called by them "copper-plate sliders"—it was sliders, and not slides in those days—and we were looking at one of these only the other day, and it seemed impossible to believe that anyone could ever have had the boldness to show them to an audience who had paid for admission. But the best hand-painted slides were exquisite; and remembering what was done then with such a poor light, it seems a pity that more attentiou is not paid uow to tone and transparency in photographs. There are many slides sent out by first-class houses, even uow, through which it is almost impossible to drive sufficient light; and out of those shown at any lantern meeting not twenty-five per cent. are as yet what they should be.

Of course we all know that the lime-light was the great improvement, it having been first used for some rough microscope work; and the oxygen was at that time made by literally driving off the gas from manganese oxide by a red heat in an iron bottle in the manner described in very old chemical treatises. The process needed a regular coal furnace, and was a long and hot piece of work. At first, also, the light was kept on in two lanterns, and dissolved by fans as before; this required a great deal of gas. Not till years after did the dissolving tap appear to remedy this waste. The two lanterns used together gave us the modern biunial, which owes its present form more to the skill and invention of Mr. Dancer, of Manchester, than anyone else; and when the making of oxygen was simplified by the cheapening of potassic chlorate, the modern state of things may be said to have been fairly inaugurated.

The more powerful light necessitated optical improvement, especially as photographs came to be used. To show the detail of a photograph sharply, achromatic objectives became necessary; while as these were perfected, it was found that the old condenser of two bi-convex lenses was not good enough, the strong spherical aberration blurring the image. Thus were generally introduced the two general forms of condenser know as the Herschel and the double-plano forms, in both of which the spherical aberration is far less. Even yet, however, the optics of the double-plano condenser are far from being generally understood, and this form is capable of being greatly improved by the simplest means. The two lenses are usually made of the same diameter and of the same curves; and hence it has been repeated over and over again, that in using large condensers, which have advantages for square photographs, there is a loss of light for ordinary-sized slides. But this need not be the case. A lens next the lime of 3¼ inches diameter, of short focus, takes up rays which require a second lens of 4¼ inches diameter to collect them. If, therefore, the second lens is the same size, all the extra marginal rays are utterly lost. They may just as well be utilised to illuminate a disc 4¼ inches diameter; and yet a 3¼ disc will receive just as much light as if the second lens were that size. Moreover, by this construction the small lens may be made much deeper in curve without increasing its thickness, and by this the spherical aberration is brought to a minimum. The greater quantity of light may easily be all passed through even the small slide, by placing

the slide-stage further forward in the cone of rays, and in this way nearly 90° of the rays from the lime may be gathered up instead of a little over 60°. It requires the triple condenser to take full advantage of these principles; but so much may be done even with a pair of lenses, that it is surprising opticians jog along so uniformly in the old grooves. In all the usual condensers, the second lens loses much light which enters the first, and requires to be nearly an inch greater in diameter to save it. If more disc is not wanted, the slide may either be brought forward in the cone, or the lens next the lime made smaller and thinner, enabling it to be brought closer to the lime with safety.

This matter is mentioned here because much of the work of the lantern in future is likely to consist in the exhibition of scientific detail; either minute detail in large diagrams and sections, or micro-photographs, which are now advancing with giant strides, and reaching a perfection and sharpness undreamt of some years ago. Now in such photographs we never get to the bottom of the detail. We go as far as the light, or scale, or our optical means permit; but there is always more behind. Even when the photograph is thrown upon the screen the human eye itself cannot distinguish all which the lantern lens really puts there; more can always be seen on going close up to the screen than can possibly be seen at average distances. Now more light means, always, that more of this detail can be seen by the audience. From this point of view the taking-up of the greater angle of rays by the condensers is beginning to assume an importance it has never had before, and it is so very easy to get in this way fifty per cent. more light than is usual, that the matter really ought to receive attention.

The necessity for clear, transparent photographs applies still more to slides of this sort than to ordinary views, though even in them it is high time the old opaque style was a thing of the past. Many slides are sent out to the opticians which really, from houses "in the trade," are a disgrace to modern progress, even as regards figure and landscape subjects. Much allowance may be made for amateurs, or even professional photographers who are only learning what lantern requirements are, but professed lantern houses should be far more particular than they are. Some appear to be supplying even worse slides now than when they were seeking a connection. No names are mentioned, as no special reference to any house is meant to be made; but all who work for the opticians ought to keep at home what are not good as lantern photographs. Upon more care in this respect for the future will very much depend the rapid development of the really scientific branch of lantern demonstration. The matter may be said now to rest almost entirely with the photographers; but there is becoming felt the want of some recognized medium through which any who have produced slides of real value may be able to place them where they are wanted. The supply of slides available for special purposes has been far too much a monopoly of one or two houses, with the result of the occasional carelessness above hinted at.

Another way in which the modern lantern may be made exceedingly useful scientifically, is in the projection on a screen of actual apparatus, whether in motion or not. At the Royal Institution, at South Kensington, and elsewhere, the electric camera is constantly used in this way. Just as an example of what is meant, at one of the recent meetings of the Physical Society, in the course of some experiments relating to the velocity of sound in tubes, it was desired to show that for the column of air contained in a tube to vibrate in unison with a given note, it must be shorter when closed by a membrane, than when closed by a rigid plate. The tube was fixed horizontally in front of the electric camera, and brought into unison with a fork (so as to give the greatest resonance) by sliding in a metal cap. A membrane was then substituted for the metal plate, in the same place, against the centre of which membrane a small pea was gently strung by a thread. The apparatus was then focussed on the screen, and when the fork was struck, no movement was perceptible; but as the membrane was pushed in, resonance was attained, and the pea was seen to start into energetic vibration.

Such experiments are constantly projected by the camera lantern; but it seems to be thought that they cannot be so well shown with an ordinary lantern. The exact contrary is the case, for it is very rarely the camera form of lantern gives such a steady light as our old friend the bi-unial. One reason is, that philosophical instrument makers stick to the four-pillar metal camera form, even with the lime-light. With the arc it is a necessity, but for the lime-light, with the usual form of jet, it is the worst construction possible; while the lanternist's jet, fixed on the pin of a sliding tray, is the "survival of the fittest" through the experience of hundreds, and gives readily a beautiful disc, almost before the laboratory assistant has begun to adjust his jet. It is wonderful, and a little amusing, to see how the instrument makers repeat their favourite, expensive, cumbersome, and antiquated construction when so much better is at hand; but that is their affair.

All that is necessary for such projections is to adjust the instrument or apparatus in the parallel or slightly conical beam from the condensers, after removing the objective. The objective must be temporarily mounted on a cradle or stand of some kind at the proper height; and all that is further needed is to surround the objective tube with a flange of black card, to stop stray light from reaching the screen. Then the lens is adjusted on the table by hand to focus the apparatus. The longer focus lenses must be used to get good results: or, if there be no long-focus lens, a simple (or unachromatic) lens of eight to ten inches focus, and three inches diameter (which can be got for a few shillings), and mounted on a pillar, will do everything perfectly well. Almost anything in reason that fairly comes within the circle of the condensers can thus be projected on the screen quite as well as in any lecture theatre, and better than in many. Of special slides, tanks, or apparatus for use in the ordinary slide-stage, there is no need to speak, as they are described in all catalogues.

Practical Papers for Beginners.

No. 4.—Exposing and Developing.

Having made a first attempt at exposure and development, in testing the lens by means of the focimeter, we will suppose that in the second place the beginner rather directs his energies to view work than to portraiture; but for the first time or so he had better not attempt anything far from home, as his next few plates will be as strictly trial plates as that exposed on the focimeter.

For a first trial a view looking over a fair expanse of scenery—whether country or town—should be selected, and the sun should be shining, but the camera should be placed so that the sun is behind it, or towards one side; indeed, it is only under very exceptional circumstances that it is desirable to photograph with the sun shining directly in front of the camera, so that the rays strike towards the open lens when the picture is taken.

Before going any farther, let us say a few words about the cleaning of the glasses of the objective. If they are clouded or dirty, they must be cleaned before the camera is used. A piece of soft wash-leather is the best material for wiping the glasses, and, when once clean, care should be taken to keep them so, as frequent rubbing is likely to take off the polish, and thus seriously interfere with the working qualities of the lens. The lens being clean, the camera is directed towards the view selected, and set as level as practicable; after which it must be set to focus. Before focussing exactly, the stops or diaphragms should be removed, and the image on the ground glass should be

examined, to see if it can be improved by bringing the camera forward or moving it farther back, so as to make it include more or less of the subject. In focussing, it must be remembered that the perfection of sharpness cannot be obtained all over the picture, and it is sometimes a little embarrassing to know what part to focus exactly. When the view is a general one, and all parts are about equally important as regards details and definition, it is a very excellent plan to select some object in the middle distance, the image of which is formed at a point about mid-way between the edge of the focussing screen and its middle. When, on the other hand, there is a leading or principal object in the view, it is often better to secure the greatest possible sharpness of this principal object. Having focussed sharply, the next thing is to insert the diaphragm or stop selected, as it is not very often that landscape pictures are taken with the full opening of the lens, and a stop, having a diameter about equal to one-fortieth of the focal length of the lens, may be used; but if a smaller one is provided with the apparatus, it will answer very well. For the present purpose the focal length may be taken as the distance from the centre of the lens to the sensitive plate. The lens is now covered with the cap, and the double dark back, containing plates Nos. 1 and 2, is placed in position for exposing No. 1 plate; but the main thing is now to get a lesson in exposure, and not to take a remote chance of hitting a correct exposure for the whole plate.

The beginner should first take a good look round, and try to fix in his mind the conditions of the illumination of the scene, making some kind of effort at remembering the intensity of the light. The sliding shutter of the dark back is now withdrawn, so as to cover about two-thirds of the plate, and the lens is uncovered during a period of fifteen seconds, as nearly as can be judged by counting seconds from memory. The shutter is now withdrawn, so as to uncover two-thirds of the plate, and an exposure of ten seconds is given by uncapping the lens. The next step is to draw the covering slide to the full extent, and to give an exposure of five seconds, making a total of thirty seconds for the first third, fifteen for the second third, and five for the remainder. Plate No. 2 is now exposed in the same kind of way. Give an exposure of two seconds to the first third, one second when the shutter is drawn so as to uncover two-thirds of the plate, and an exposure with cap off and on as quickly as possible when the shutter is entirely drawn. During the whole work care should be taken not to shake or move the camera.

We thus have on the two plates a series of widely differing exposures, which may be estimated as follows:—

30 seconds
15 ,,
5 ,,
2 ,,
1 second
Short exposure—perhaps a fourth of a second.

Unless the light was quite exceptionally bright, the least exposed section will be much underdone, and then it is likely that the section which has had thirty seconds will be over-exposed. At any rate, the beginner will obtain the required lesson on exposure by developing these two plates in the same dish with the standard developer, or equal proportions of No. 1 and No. 2, as mentioned on page 486. After having allowed the developer to act for about six or eight minutes, the plates should be washed and fixed as recommended in the last paper. The photograph obtained on the sensitive plate is a negative, and we will suppose that one section shows the image boldly, clearly, and with proper vigour and gradation when the plate is held up to the light, and the exposure of this section may be taken as the correct one. Let a couple of plates be now exposed under similar conditions, and be developed with the same developer; and these plates we will hope will turn out passable negatives. One point must, however, be remembered: if the negatives look good enough to be kept for printing, the plates should be allowed to remain in the hyposulphite bath twice as long as is necessary to make the yellowish-white bromide of silver disappear, and after fixing they ought to be soaked in six or seven changes of water, allowing about ten minutes in each. The beginner must repeat the above process of graduated exposure until he gains that experience which is the only safe guide in photography, and during his earlier experiences it is well to use the same stop throughout, and to endeavour to obtain good negatives by adapting the exposure to the normal developer, or equal parts of No. 1 Solution and No. 2 Solution, made up as described in our last paper.

It is, however, probable that the enthusiastic amateur photographer will not long be able to restrain his ardour, but he will boldly take the camera away from home, and will find that his plates are over or under-exposed. By a study of his trial plates, and attention to the remarks made last week, he will be enabled to immediately recognise a much over-exposed or under-exposed negative, to say nothing of the circumstance that development will be extremely slow in the latter case; and although we propose to say something more about exposure and development next week, we will now indicate how the developer may be modified to more or less perfectly compensate for under-exposure or over-exposure. If the image appears very slowly, prepare a fresh developer with three, four, or even five parts of No. 1 to one of No. 2, and, after having poured off the first developer, allow this to act on the plate. Should one of a batch of similarly exposed plates turn out to be much under-exposed, the remainder may be treated in the first instance with a developer containing several parts of No. 1 to one of No. 2. When a plate is a little over-exposed the reverse holds good, No. 2 solution being used in considerable excess; but in the case of considerable over-exposure other treatment is required.

It is to be hoped that the beginner who has followed our instructions thus far, begins to feel a forshadowing of something like certainty in his work, and next week we will suppose the camera to be taken a little way from home, and we shall treat in greater detail of development and exposure.

VOGEL'S METHOD OF COLOUR PHOTOGRAPHY.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

Dr. Vogel's letter in your last issue has made it incumbent on me to offer a few remarks on his method of colour photography. I may preface them by saying that I am somewhat surprised that the method he indicates is called new in any sense of the word, as I always imagined that the principles of the process dated from 1874, when Dr. Vogel told the world the practical action of dyes, though his theoretical explanation thereof was to my mind not so satisfactory as the experiments themselves. So much did I personally imagine that this method of rendering colours in the true value of their illumination was an accomplished fact, that in the course of lectures in March last I illustrated Vogel's discovery by the staining of films with both eosine and cyanine, and showed that, more especially with the latter, the brightest yellows were rendered with greater intensity than were the blues in a negative taken from the most admirable colour chart which forms a plate in Professor Piazzi Smyth's "Madeira Spectroscope." I did not describe it as a novelty, though the lecture was delivered in March of this year, almost at the same time that Dr. Vogel made his communication to the Berlin Society for the Advancement of Photography. I need scarcely say that the lecture was prepared some weeks before it was delivered.

Now as to a practical manner of rendering colour in even better illumination gradation (if I may coin a word) than cyanine gives. I have tried a mixture of cyanine and eosine together, and that gives a better result than either

separately. An emulsion, whether it be collodion or gelatine, can be rendered sensitive to red, yellow, and green, by mixing with it a mere trace of cyanine, and a rather stronger proportion of eosine. The absorption spectrum of the mixture is not exactly that compounded of the absorption spectra the two give separately, but rather more complicated; but at any rate it acts in the manner indicated above. The plates should show a faint rose colour. The cyanine should be dissolved in a small quantity of alcohol, and the eosine will dissolve in water, and then the two may be mixed and added to the emulsion. Plates prepared with emulsion so stained do give an increased value to yellows and reds; but with gelatine, in order to tone down the blue, it is preferable to illuminate the object with light passing through a canary yellow glass. Dr. Vogel also recommends taking the negative through yellow glass, a method which I have used with ordinary gelatine plates for colour photography, and which I mentioned when Mr. Sawyer read his paper last season on a kindred subject to that now under discussion.

To use eosine effectually, an emulsion of eosine can be made in an aqueous solution of it by adding silver nitrate to it. This should be rapidly washed, and added in very minute quantities to a gelatine emulsion, where it will be found to help the greens of the picture favourably. This plan I adopted when experimenting on the action of dyes some two years ago for the benefit of Professor Rowland And if eosine is to be used *per se*, I recommend this plan of getting the full benefit of its action rather than merely staining the film with it. I am speaking now of a gelatine plate in which silver nitrate is in defect.

I should be much interested in trying Dr. Vogel's new dye which he has found answers so much better than eosine. Perhaps he would present me with a minute quantity to test.

In conclusion, I would add that to any one possessing an electric light, the method of illuminating with feeble yellow light is very easy. A condenser placed in front of the light should be made to form an illuminated disc, in which is the picture to be photographed. By placing a piece of canary or even rather yellower glass between the lens and the condenser, the desired illumination is at once obtained. Sunlight may also be reflected on to a picture in a somewhat similar manner, and this is also effective

AN AMATEUR'S EXPERIENCE.

BY ONE OF THE LATEST VICTIMS TO PHOTOGRAPHY.

I ALWAYS had a hankering after art. I once took some lessons in drawing at South Kensington, London, and these were so successful that I drew a prize at a lottery shortly after.

At last, the drawing master said to me, "You have evidently a wonderful talent for landscape." I admitted that I had. "But," he continued, "you are labouring with the wrong implement. A camera, not a pencil, is what you need."

I was a little nettled at this; it seemed like telling a pianist that a hand organ was what he wanted. I said sarcastically:

"I suppose you would recommend one of those photographic cars to go round the country, with a team hired from the local livery stable to haul it from village to village?"

"Well, not at first," he answered gravely. "Of course, you may rise to that in time. But don't be too ambitious. Get a 4 by 5 camera, or one even smaller, and try landscapes to begin with."

I gathered up my drawing materials, and South Kensington lost one of its most promising art students.

Shortly after I became acquainted with an amateur photographer who had an instrument made in New York. I was astonished to see an American camera in England, but the photographer said that unless a person went to a very high price, American instruments were the best, and that it paid to import them. Score one for American mechanism. A Dallmeyer lens, and I think a Ross—although of that name I am not sure—he said, were better than anything America had yet produced, but the cost was something appalling, and not to be thought of by an amateur with whom money is an object. We did some fine tramping over the hills of Kent and Sussex, and little that was picturesque escaped us. Old churches were the favourite. They remained very still, and the grave-yards around them never required to be told not to move.

On coming to America I got myself an amateur outfit, and began a still hunt for victims. My camera will take a picture 5 by 8 inches. This is a little too big, or would be if there was not an arrangement by which a 4 by 5 plate can be used. The large plates cost $1.75 a dozen, and the smaller ones only 90 cents, so the initiated will speedily find that for experimentiug the smaller plates are preferable, especially if he develops a genius for spoiling plates.

The best plan is to get a real photographer to give you the points about trimming and developing. The real photographer will despise you as an amateur, but you'll survive that, and you can pick up information quicker from him than from a book, especially at first. It is a little trying to go through the street with a tripod under your arm and a camera in your hand if many people know you, but as I have undertaken to show you the way out of some of the difficulties attending amateur photography, I will give you a hint on this.

One morning, as I went up Woodward Avenue with my outfit, I met more people than ever I met before in a similar space of time and distance.

"Hello!" said the first, "what's this you've got?"

"Photographic arrangement."

"You don't say so? Where are you going to start? I should think that with so many photographers in town, and cabinets at $2 a dozen, there was not much money in the business."

"Oh, I'm only an amateur. Good-day."

Next block, another friend stopped me. "What have you got there? Surveying instrument?"

"No."

"'Tisn't one of those bird-case fortune telling affairs is it?"

"No, it isn't."

"Haven't taken to peddling, have you?"

"No, I haven't."

"Well, what in thunder is it?"

"In this box, my inquiring friend, is a camera with a Morrison lens. I don't know who Mr. Morrison is, but 'distance lens enchantment to his view.' The patent arrangement by which the plate is turned is by some one else whose name I forget. The tripod is covered with varnish and four patents, and if there is any more information you want, I'll call around at your office."

"Never mind," he said, "I've had all I can stand at present."

As he left, I thought over what he said about peddling. The next man who said "hello" to me I shook cordially by the hand and said: "I'm an agent for the new work to be completed in twenty-four parts, at fifty cents a part. Just let me show—"

"Excuse me," he cried, hurrying off, "I want to catch that 9.15 train."

This hint will protect the amateur as he walks abroad with his instrument of destruction.

There is no use in my giving instructions about photography. The best man to give you the preliminary hints is your friend the photographer. Everybody knows at least one photographer. Even with the best instructions you will make awful work at first. Your plates will be overdone and underdone, just like the plates you order at a poor restaurant. But let nothing dismay you. The simplest matter is to get a good lens and use a drop-shutter. Then you have no trouble. There is a young man, a clerk on the steamer running out of Detroit, who uses a Morrison lens and a Scovill camera, and who made a drop-shutter that enables him to to take schooners on the wing and steamers as they hurry past. It is hard to find a nicer subject than a schooner with white bulging sails, and the white feathery spray dashing up at her bows. As I was saying, this ingenious young man made his own instantaneous arrangement, and it works as well as one costing $10.

I undertook to photograph a steamer from a small boat on the Detroit River the other day. The boat wabbled round a good deal, but I succeeded in getting a couple of shots at the steamer. On developing the plates, I regret to say that, owing to the motion of the small boat, my pictures were incomplete.

The first was a beautiful view of the clouds with the top of one smoke-stack and the one mast, and the other was an equally beautiful view of the water, with the black rim on top, which, I presume, represents the lower part of the steamer's hull. I always bring my pictures to a photographer to be developed and printed. The man said to me, "What I like about your pictures

is their unconventionality. You get out of the old routine. There is a spice of originality in all you do with a camera, and I wouldn't be surprised if you stumbled on to some valuable discovery before long."

I think that was pretty high praise for a fellow who had only recently begun photographing.

Of course, the first thing an amateur photographs is his house and the surroundiog. I took half a dozeu of my house, with the family scattered round the grounds, and I laid the holders, with the plates inside, away carefully in a dark drawer till I was going down to the photographer. Next day I brought the six to him, and we went together into a close little room, with the dim ruby light as the only illumination. He took out a plate and placed it in a shallow tray. Of course, until developed there is no picture visible. The developer was poured over the plate and the tray gently moved in an oscillating way, so as to keep the liquid moving and not allow any air-bubbles to staud on the glass.

"It don't seem to come out very well?" I veutured.

"No," said the phrtographer; "it's fogged."

"Fogged? I don't see how that can be. There was no a sign of mist in the air."

"Well, you've 'mist' it this time, anyhow. Light got on the plate. How did you put the plates in the holder?"

"I did it in a dark-room, by the light of my ruby lantern."

"No white light got at it?"

"Impossible."

"Did you leave the holders in the sun? Sometimes they are not as tight as they should be."

"No, I kept them wrapped in a black cloth."

"Well, that plate's spoiled. Let's try another."

We tried another, and another, but they were all bad, all "fogged."

"Perhaps the plates were spoiled in the package?"

"I have used thousands and never got a spoiled plate yet," said the photographer; "you've let light in on them somehow."

When I got home, I said to my wife, "All those plates were spoiled, so all the grouping you and the childreu did will have to be tried over agaiu. I can't imagine what spoiled the plates."

"I was going to tell you they were spoiled, and so save you the trouble of taking them down, but I forgot all about it. I don't think you uuderstaud it rightly."

"How did you know they were spoiled?"

"Oh, Mrs. Butterwick was here, and she wanted so much to see how the baby took, and I opened the cases and there wasn't the sigu of a picture on one of the plates."

If this should chance to meet the eye of the wife of any amateur photographer, I hope she will resolve to leave his photographic studies alone, at least until they are developed, unless she wants to develop in him an unexpected proficiency in profanity.—Luke Sharpe in the *Detroit Free Press*.

A Dictionary of Photography.

ANTIMONY.—Printing Process. The metal antimony is the main factor in a somewhat remarkable printing method, due to Mr. F. Jones. The process depends on the circumstance that antimonuretted hydrogen or stibine, NH_3, is decomposed by sulphur in the presence of light, orange sulphide of antimony being formed. Paper is impregnated with sulphur, and placed behind a negative, a stream of antimonuretted hydrogen being passed into the printing frame while it is exposed to the light.

For the preparation of the sulphur-paper Mr. Francis Jones saturates ordinary writing paper with a solution of sulphur in carbon disulphide, and allows the solvent to evaporate in the air. By this means minute crystals of sulphur are left deposited in the pores of the paper; and any excess remaining on its surface can be rubbed off with a tuft of cotton wool, so as to secure uniform impregnation. No fixing process is required, for as soon as the printing has advanced sufficiently far, it is only necessary to stop the evolution of the gas, or disconnect the generator, whereby all further action is prevented, and the image remains as a permanent metallic sulphide imbedded in free sulphur. The tint thus resulting is identical with that of the pigment used in the production of red rubber goods, and is believed to be equally permanent. Spiller finds that an after treatment with silver or copper salts in solution transforms the orange sulphide of antimony into the darker coloured sulphides of those metals; so that the process, thus modified, lends itself to the production of photographs of a more agreeable tint.

The prints may be toned by immersion in a cold solution of ammonio-nitrate of silver, which quickly blackens the sulphide of antimony. In a similar way, ammonio-sulphate of copper may be used as a toniug ageut, an agreeable chocolate or brown tiut resulting.

The antimonuretted hydrogeu is prepared by dissolving a granulated alloy of zinc with one-twentieth of its weight of antimony in dilute sulphuric acid, the usual hydrogen apparatus being made use of; but the greatest care is required to avoid inhaling any of the antimonuretted hydrogen, as it is extremely poisonous.

APERTURE.—By aperture of a lens is generally understood the smallest clear way for the light, whether this be the diameter of the glasses or that of the diaphragm.

APLANATIC.—*See* Lenses.

AQUA REGIA.—A name applied to a mixture of nitric acid or hydrochloric acid, say one volume of the former in three or four of the latter. Such a mixture dissolves gold, the terchloride heing formed.

AQUEOUS.—Watery: prepared with water, as aqueous solution, the liquid obtained by dissolving a substance in water.

AREOMETER, synonymous with hydrometer. *See* Specific Gravity.

ARGENTOMETER.—A hydromcter specially graduated, to indicate the strength of a nitrate of silver solution. For testing the bath, whether for printing or for collodion work, the following method is satisfactory:—Prepare a solution of 32 grains of pure chloride of ammonium in 12 ounces of water; 1 drachm of this solution will, therefore, precipitate 1 grain of nitrate of silver. Measure out very carefully a known quantity of the bath to be tested (2 drachms, for instance), place it in a 2-ounce phial, and add a few drops of nitric acid. Now measure out exactly 1 drachm of the solution of chloride of ammonium, and add it, by a few drops at a time, to the silver solution in the bottle, corking it up and shaking violently between each addition, until a white precipitate is no longer produced on the addition of another drop of the test solution. If, before this is accomplished, the first drachm of test solution be exhausted, carefully measure out a second drachm, and so on until the desired point is attained. When finished, the nnmber of drachms of test solution nsed will indicate the nuumber of grains present *in the phial*. Thus, supposiug 2 drachms of the nitrate bath had been placed in the phial, and it required 7½ drachms of test solution to precipitate the silver, that would have shown that the 2 drachms of bath contained 7½ grains of nitrate of silver, or 30 grains to the ounce.

ARROWROOT.—This name is generally applied to a form of starch obtained from the tubers of the *Maranta arundinacea* and other plants. It is occasionally used in preference to other forms of starch as a sizing material.

ARSENIC.—An elementary substance which is sometimes classed among the metals, and at other times among the non-metals. The compounds are very poisonous, and have not many photographic applications. Prints can be obtained by the action of arsenuretted hydrogen on paper containing free sulphur, just as in the case of antimonuretted hydrogen. *See* Antimony Printing Process. Bromide of arsenic has been used in collodion.

ARTIFICIAL LIGHT.—*See* Light.

ARTIFICIAL PARCHMENT.—*See* Paper.

ARTOTYPE.—A name applied to a mode of working the collotype process. *See* Collotype.

ASPHALT OR BITUMEN.—A substance also known under the name of Jews' pitch, mineral pitch, or compact bitumen. It is found in abundance in several localities, especially near the Dead Sea, and the famous *pitch lake* in Trinidad. It resembles in appearance common pitch, sinks in water, melts easily, and is very inflammable, burning with a red smoky flame. Asphaltum is a body of great interest to the photographer, as it was one of the substances used by M. Niépce in the early days of the art for the purpose of preparing a coating sensitive to light. The process was called by the inventor Heliography, and is thus described in his own words:—I about half fill a wine glass with this pulverised bitumen. I pour upon it, drop by drop, the essential oil of lavender till the hitumen can absorb no more. I afterwards add as much more of the essential oil as will cause the whole to stand about three lines above the mixture, which is then covered, and submitted to a gentle heat until the essential oil is fully impregnated with the colouring matter of the bitumen. If this varnish is not of the required consistency, it is to be allowed to

evaporate slowly, without heat, in a shallow dish, taking care to protect it from moisture, by which it is injured, and, at last, decomposed. A tablet of silver is to be highly polished, on which a thin coating of the varnish is to be applied cold, with a light roll of very soft skin; this will impart to it a pure vermilion colour, and cover it with a very thin and equal coating. The plate is then placed upon heated iron, which is wrapped round with several folds of paper from which, by this method, all moisture has been previously expelled. When the varnish has ceased to simmer, the plate is withdrawn from the heat, and allowed to cool and dry in a gentle temperature, and protected from a damp atmosphere. The plate thus prepared may be immediately submitted to the action of light in the camera. But after exposure nothing is apparent to show that impressions exist. The forms of the future picture remain still invisible. The next operation, then, is to disengage the shrouded imagery, and this is accomplished by plunging the tablet into a solvent consisting of one part, by volume, of essential oil of lavender, and ten of oil of white petroleum, until the operator, observing it by reflected light, begins to perceive the images of the objects to which it has been exposed gradually unfolding their forms, and, though still veiled by the supernatant fluid, continually becoming darker from saturation with varnish. The plate is then to be lifted out, held in a vertical position till as much solvent as possible has been allowed to drop away, and then carefully washed under a stream of water. This process was very uncertain and tedious, as exposures of six or eight hours in the camera were required.

The asphalt process of Niépce is an excellent method for obtaining an image of a line subject on stone or zinc, for surface printing or typographic etching, and the following directions for working on zinc are equally available for stone:—

The asphalt selected for preparing the sensitive solution should be light brown in colour, and have a decided odour, and, at the same time, should not be so exceedingly dry and resinous as to be easily crushed into an extremely fine powder. A quantity of the sample selected should be powdered as finely as possible, and put into a bottle so as to about one-third fill it; after which the bottle is nearly filled with ether. The bottle should now be corked, and agitated at intervals during about five hours, when the powder is allowed to settle, and the clear etherial liquid is poured off. This washing with ether is repeated several times—in fact, as long as the ether dissolves anything out of the bitumen—after which the remaining asphalt powder is collected on a filter, and allowed to dry in a warm and dark place. The dry powder thus obtained is dissolved in benzole, so as to form a solution having about the consistency of ordinary black varnish or Brunswick black, and the solution is stored up in a dark place for use.

The zinc plate having been carefully cleaned and prepared, a portion of the bitumen solution is diluted with about its own bulk of anhydrous benzole, the solution being filtered if necessary; after which the plate is coated, just as a glass plate is coated with collodion, and placed in a warm and dark place to dry. Before exposure under the reversed negative it is well to dust the surface of the bitumenized plate over with French chalk, in order to prevent its adhesion to the negative; but, of course all excess of French chalk should be wiped off before the plate is placed in the printing-frame. In ordinary cases, an exposure of one or two hours is required in good diffused daylight. It is scarcely necessary to say that great care must be taken to ensure the complete contact of the negative with the coated zinc plate.

The exposure being ended, and the plate taken into the dark room, its surface is carefully mopped over with a tuft of cotton-wool moistened with oil of turpentine; after which, extremely gentle friction may be applied with the same tuft of wool, the greatest care being necessary to treat all parts of the film with equal force. Under these circumstances, the unexposed portions of the film gradually dissolve away, and the device appears in sharp brown lines on the plate. The development being complete in all parts, a similar tuft of wool charged with olilve oil is applied in like manner, this operation serving not only to arrest the solvent action of the turpentine, but also to remove the bitumen already dissolved by the essential oil. The excess of oil having been wiped off, the plate is gently scrubbed with a tuft of cotton charged with a lather of soap and water, this operation being alternated with washings under a water rose. When all traces of oil have been removed, the bulk of the water is removed by means of blotting-paper, and the plate is fanned till perfectly dry, and placed in a good light for an hour or so, in order to thoroughly fix the bitumen film.

The stone or zinc is now gummed, and treated in the usual way for printing.—*See* Lithography and Zincography.

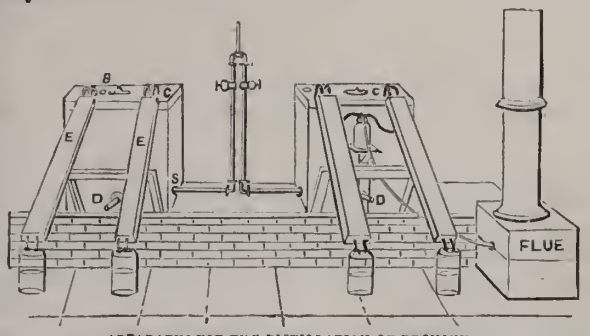
THE MANUFACTURE OF BROMINE AT POMEROY, OHIO.

BY CHARLES C. SEEBOHM, PH.G.*

Bromine is produced from the bittern of our salt-works, and was formerly a waste product. At the present time, however, it is utilised, and produced on an extensive scale.

Before proceeding with the details of its manufacture, I will give an idea of the bromine shop. This is a small wooden structure, usually situated between two or more salt works, with which it is connected by means of hollow log pipes, in order to easily obtain the supply of bittern. Inside the shop two wooden reservoirs are placed for storing the bittern; a furnace in which the bittern is heated preparatory to entering the stills, and two large stone stills or retorts, from which the bromine is distilled. The shop to which I have referred is located near the Excelsior and Buckeye Salt Works, and is run by Mr. Herman Lerner, of Mason City, W. Va. The above-named works supply this shop with bittern. After it enters the shop it is allowed to cool, after which it is passed into the purifier. From the purifier it enters the furnace where it is heated preparatory to passing into the stills, which are two in number. These stills are rude stone chambers hewn out of blocks of our native sandstone. Each is about six by eight feet in size, the tops being capped. In this cap or top there are two funnel-shaped openings, the one in the centre for introducing sulphuric acid, and the other near the corner for inserting the black oxide of manganese, and these funnel-shaped openings extend by a pipe thirty-two inches into the stills.

Each still is connected with two condensers, which in turn are connected with the receivers. The condensers consist of wooden troughs made of heavy poplar wood, and they are kept cool by allowing cold water to run over them. The receivers are large glass bottles, capable of holding the product of one distillation. The condensers and receivers are connected to the stills by means of lead pipe, and are made air-tight by means of bank clay.



APPARATUS FOR THE DISTILLATION OF BROMINE.

A, opening for introducing sulphuric acid, funnel-shaped; B, opening for introducing oxide of manganese, funnel-shaped; C, lead pipes connecting still with condensers; D, opening for letting out exhausted material; E, the condensers; F, flue which receives the impurities; I, receiver which contains impurities before passing into the flue; S, pipes for passing in steam; R, receivers for the bromine.

Between the condensers, and connected with them, a large glass bottle is placed, and here the uncondensed vapours escape together with a little bromine, which remains in the bottle while the vapours pass through a large lead pipe into what is termed the flue.

This is made of square hollow sandstone pipes about two by three feet, placed upon one another, surmounted by two fire-clay chimneys. These chimneys are filled with common coal cinder, or with charcoal, and this is kept moist. The escaping vapours pass into these flues, and if appreciable amounts of bromine are present it is purified, and condensed, and is obtained at the bottom of the flue. The stone retorts spoken of are capable of holding a charge of four hundred gallons of bittern, seventy-five pounds of sulphuric acid, and thirty-five pounds of black oxide of manganese. After filling them with this mixture, steam is passed into the charge. Chlorine gas is thereby liberated, which acts upon the soluble bromides, and decomposes them with the liberation of bromine, which distils over into the condensers. The resultant chlorides, after the charge is exhausted, are at the present time run off as waste products. After the bromine condenses and is collected in the receivers, it is drawn into glass

* A thesis presented to the Cincinnati College of Pharmacy, 1884.

stoppered bottles, each capable of holding from ten to twenty pounds, and it is now ready for market.

On an average, the bromine shop I have named manufactures five hundred and twenty-five pounds of bromine per day. During the past year our shops, nine in number, with a running average of three hundred days, yielded 159,500 lbs. of bromine. This yield was over and above the demand, and in consequence its production was followed by some cutting of prices. Two parties control all of the bromine manufactured, and yet they endeavoured to undersell each other.

Some years ago, they received three dollars per pound for it, but the year which has passed returned them but twenty-six and twenty-seven cents.

Notes.

The striking photograph of an encampment in the desert, which is our supplement this week, was taken by Mr. Baden Pritchard one morning soon after sunrise. He thus told the tale of its production:—"There are plenty of encampments to choose from, so we are not long in getting what we want. At one point a dozen camels lie together in a picturesque group, and we approach to within twenty paces. Alas! before I have done focussing, a wretched dog has jumped out of the circle, and is baying and barking at the legs of the tripod. Some half-sitting figures rise to their feet precipitately—women almost black—and the camels stretch out their snake-like necks. A rapid exposure is made, but before I can turn the slide round to get a second one, Jones cries to me to 'look out.' It is a couple of Arabs who are striding along as fast as they can without running. Neither of us is afraid, of course, but we think we had better move off, and so we do."

A correspondent suggests to a contemporary that the judge's box on every race course ought to be supplied with a camera, by which the official who occupies the judge's chair could obtain an instantaneous photograph of the finish of the race as the winning horse rushes by. The object of the suggestion is explained, though it is of course obvious. It is intended that the judge should be able to justify his verdict of a short neck, a short head, or possibly a dead heat, by producing a negative on which the actual position of the first two or three horses was clearly shown.

Our contemporary concludes that as the *Flying Dutchman* can be "taken" as it rushes by at a rate of sixty miles an hour, race horses could assuredly be photographed as they fly past the winning post; whilst the only extra trouble necessarily imposed on the judges would be to press a knob or pull a trigger at the supreme moment.

It is even said that the suggestion has been laid before the Jockey's Club, and that action with regard to it is not unlikely. May we then assume that at the Derby of the future the hoisting of the winning number will be followed by the public exhibition of Judge Clarke's photograph of the finish, that the "c'rect card" will be supplemented by the "c rect carte" of the race?

Only fancy the public's anxious suspense whilst the said "c'rect carte" was being "developed" in some dark recess under the Grand Stand! Fancy, too, how copies of a close finish would sell on a crowded race course, and, perhaps, found the fortunes of a photographic Dorling. And lastly, though not leastly, fancy what jokes the comic journals would make about the Derby winner being "drawn in a carte and developed" after the race, and all the rest of it. Certainly we would pray, with John Gilpin, that when Judge Clarke first uses his instantaneous camera, may we be there to see!

From a technical point of view there are difficulties, but not more than might be overcome by energy and application. A white background on one side of the course, and a powerful beam of electric light streaming from underneath the judge's box, would certainly be required in dull weather.

The Director of the Note Printing Department of the Imperial Bank in Vienna thought that photo-engraving might be useful in his department, so he availed himself of the services of Herr C. Angerer (the head of the firm of Angerer and Göschel), the well known photographic engraver of Vienna. Herr Angerer, who represents the technical skill and energy, received the somewhat bare reward of mere *Imperial recognition*, while Herr Mayer, the Bank official, was promptly invested with the knightly order of Francis Joseph. This savours a little of South Kensington.

A society journal tells us that the cost of sitting for a photograph is being discussed—it does not say where, nor by whom. It is instructive, however, to be told that photographers "have much to learn," as they "make it by far too rapid an act, and seem intent on 'work' the moment they get a sitter in the chair and have screwed the holdfast into the back of the head (*sic*)." The writer in question says he was told by a distinguished sculptor that a certain great actress was a most difficult sitter, for she was in the habit of "changing her chin—that is, the size and form of it varied on different occasions—and asks what a photographer would say to the difficulty. Clearly a sitter with this Proteau-like propensity would be extremely awkward. Nothing short of Mr. Galton's system of composite portraiture could possibly do her justice.

The realistic spirit in realism which the idea of the "Old London" street has developed at the "Healtherics', is so correct, as a rule, that little slips and anachronisms are all the more noticeable. It is not surprising, then, that the presence in one of the mediæval shops of a young lady, carefully dressed in the costume of the sixteenth century, and busily engaged in selling photographs, should be criticised. But it is difficult, nevertheless, to decide what kind of views she could sell in their place that would be in keeping with her surroundings.

Daguerreotypes seem, it is true, to carry us back to the dark ages, but they would be, as a matter of fact, only a little less anachronatic than the photographs themselves. "Scissorgraphs," again, by which we mean those sable

silhouettes with the eyes and hirsute appendages touched in with gilt, which were so numerously produced by the artists' scissors, until finally "cut out" by the invention of photography, would not really be more characteristic of the "Old London" Mr. Waterhouse has designed, than the cartes and cabinets actually on sale there. To put the matter briefly, even those who complain of the disposal of the photographs would find it hard to suggest a suitable substitute for them.

The mention of "scissorgraphs" recals the fact that there still exists in London—Modern London we mean, not "Old London"—a misanthropic "Scissorgraphist" who is only seen at night when he prowls about the bars and buffets of Fleet Street and Ludgate Hill, bearing a ragged portfolio under his arm, and bitterly lamenting the good old days when he cut out half a hundred profiles before dinner. This "Old Master," to whom the mention of photography is as the sight of a red rag to a bull, has no pupils, we believe, and when he passes away there will be no capable hand, probably, to which his well-worn scissors can descend, and his "black art" will die with him.

Talking of lost arts, each successive Royal Academy Exhibition tends to show that miniature painting is now well nigh a lost art also. Before the invention of photography, however, there was not a town of any importance that had not its miniature painter, who produced in any quantity those pale, wishy-washy portraits (save the mark!) on ivory, which, as a rule, possessed such a strong family likeness to one another. Their production was, in fact, too often much more like manufacture than an art.

At Cork, for instance, whence, in the days of the Miss La Creevy miniature, a large number of military officers used to sail for foreign service, there was an artist who did a most extensive trade in supplying families with miniatures of their departing relatives. He had often, indeed, to paint two or three dozen of them in the course of a few days. And this was how he used to manage, according to Mr. T. G. Whaite, who was entrusted with his confessions. His plan then was to keep in stock something like half a gross of painted bodies in uniforms of varied rank, from an ensign to a general. These were all practically finished, and all that was necessary on getting the order was to hastily paint in the faces, adding the necessary local colouring for either black, brown, or auburn hair, and the colour of the eyes, with the necessary alterations or additions to make the facings of the uniform correct. Customers thought more of these facings, in fact, than the faces, as we may easily gather from the survivals (not always of the fittest) which have come down to us.

Of the uses to which photography is applied there is assuredly no end. One of the latest is to assist leather merchants in imitating alligator skin. A photograph of a genuine alligator hide is taken, and a copy of it produced in bichromated gelatine, from which a metal die in turn is executed. This die is then pressed heavily on skins of cheap calf and other leather, and, as a result, all the curious markings of the alligator hide are transferred to them so exactly, that only experts can detect the imitation.

The increase in the manufacture of pyrogallic acid has been something enormous since the advent of dry plates. It can scarcely be said that there has been quite a corresponding decrease in price, a result which generally follows when a chemical compound is much in request.

A correspondent asks: How long are gelatine plates supposed to keep? He asks the question because he recently bought a batch which were very insensitive, and has reason to suppose they were a portion of old stock. He suggests that makers should date each batch, so that photographers might know what to do. It would be interesting to have the opinion of manufacturers on this point.

Young men about to start as itinerant photographers would do well to take advantage of the experience of a writer in a Brighton paper, who has had ample opportunities on the Brighton beach of watching the ways of the fraternity. According to this observer they shun papa and mamma and family, but cautiously broach their business to groups of young men, insinuatingly approach sentimental couples, and bear down boldly on any young gentleman who has two ladies in his charge. The last named are nearly always safe game.

At Potsdam, in the Villa Liegnitz, several members of the Imperial family may be seen at work with the camera or the brush almost daily (a spacious apartment having been set aside for oil painting), while frequent excursions with the camera are made by Prince Henry, Prince William, and others. Most visitors take away their own portraits when they leave, or perhaps a few views of the neighbourhood.

Photographers are not alone in their complaints of the badness of the season. The sale of pictures in the Royal Academy, just closed, has been smaller than for many years past.

The collodion and silver bath have done good work, and are not yet altogether ousted by their rival—the gelatine plate. It is, therefore, almost unkind to speak of the negative bath in the way a member of the Chicago Amateur Club did the other day, "as a sloppy business." It takes away all romance to say, as this gentleman said, that "for twenty-five years he had worked in the slops of silver!"

That it is possible to make an improper use of the photographic portraits of convicts is indicated by the complaint of Wright, a prisoner at Worship Street, who said that the policeman who identified him when he was brought out with other men in the yard of the police court had been previously prepared for the occasion by a study of his (Wright's) photograph. The authorities should investigate the matter, and, if the imputation is true, all concerned ought certainly to be removed from the public service.

An American paper has just got hold of a wrinkle that was discussed on this side of the Atlantic at least a year ago, when we told the story of Mr. Trueman Wood and others photographing the vocal organs of famous singers, with a view of obtaining actual visual information as to how the larynx, &c., was shaped in forming this or that note, and so on, and so forth.

Now this is quite enough, of course, to set off our American contemporary, which gravely suggests that it supposes the public will soon be enabled to procure *cartes* of Patti's "upper C" and Sims Reeves' "chest D." We shall have æsthetic vocalists, it asserts, striving to live up to Mr. Oscar Wilde's "A sharp"; or sitting up all night by the side of his "much resounding C." Whilst curiosity, it adds, will doubtless lead to a large sale of copies of the Duke of C.'s well-known "big, big D." The sale of the new "Photographic Notes" would, in fact, according to our contemporary, be almost as brisk as that of the old-established variety.

Patent Intelligence.

Specification published during the week.

7,746. THOMAS FURNELL, of 1, Matlock Villas, Lordship Lane, East Dulwich, London, in the county of Surrey, Civil Engineer, for "An adjustable instantaneous shutter for photographic purposes."—Dated 15th May, 1884. (*Complete Specification.*)

A double flap-shutter with a number of very complex adjustments. The inventor prefers to make the flaps of ferrotype plate or other similar material faced with velvet, but he winds the material, nearly one turn, round the spindle before attaching, apparently with the view of giving elasticity. Although there are no less than twenty diagrams accompanying the specification, we find none of them, or the details illustrated, to be of sufficient interest to justify us in allowing them to occupy as much space as they would fill.

Patents Granted in America.

302,386. CHAS. E. DRESSLER, New York, N.Y. "Machine for grinding the rims of lenses." Filed February 27, 1884. (No model.)

Brief.—Adjust the clamp-support for one required bevel, and set it at one side of the centre of the grinding-surface and grind it. Reset the lens at the same angle, with opposite inclination at the other side of the grinding-surface, and grind the other bevel of the rim of the lens. The arm which supports the clamp is held by spring-pressure at predetermined distances from, and toward, the grinding-wheel. The clamp has a continuous step motion to and fro across the face of the grinding-wheel. The bed of the lens-holder is adjustable to and from the emery-wheel.

THE CAMERA AND ITS APPURTENANCES.

BY LIEUT.-COLONEL W. C. NOVERRE.*

NEXT in importance to the camera is the lens. Here there is not the same difficulty in selection. It may be said that the amateur has only three or four kinds of lenses to select from. It is not intended to describe the various lenses in general use, as full descriptions of them are given in the last volume of the NEWS. The choice will probably be between a simple or a wide-angle landscape lens, and a lens of the rapid rectilinear type. The former instrument will usually be found to answer all the requirements of the amateur landscape photographer. It has many advantages over the rectilinear lenses; it is a much cheaper lens, and it has greater depth of focus; the diaphragm, being in front of the lens, protects it from diffused light; and a rotating plate, pierced with suitable holes, attached to the lens, takes the place of the set of Waterhouse diaphragms. The single combination lens went out of fashion in the days of wet collodion because of the long exposure it required; but with gelatino-bromide plates this lens will be found quick enough for ordinary work, and for landscape photography is preferable to any other form. For architectural subjects, and for photographing moving objects, the rapid rectilinear, or a lens of similar construction, will be preferred. When using this kind of lens, it is important to close the diaphragm slit carefully, even when a stop is used. When a stop is not used, an elastic band, passed round the mount, so as to cover the slit, is the simplest arrangement. When a stop is inserted, two bands may be used, so as to press against the stop on both sides; or a small velvet or thin leather cap may fit over the diaphragm, and may be held in its place by an elastic band on each side; the bands alone, if properly adjusted, are, however, sufficient. When a lens of the above type is used, the lens, having its front combination exposed, must be sheltered from the sun's rays and from all diffused light. Although the necessity for such a precaution has been insisted upon for years by many critics, it is a singular fact that none of the camera-makers supply any arrangement of the kind. A simple plan, and one that has been often suggested, is to have light wood or metal struts to screw on either side of the camera-front; by throwing the focussing cloth over these during exposure, the lens is protected to a great extent. It is not, however, a very perfect arrangement; it does not cut off the light which is reflected from the foreground, and the wind may blow the cloth across the lens. A stiff pasteboard funnel fitting on to the lens is effective, but is an awkward thing to carry about. A funnel of black velvet, projecting in front of the lens about five inches, attached to it with an elastic band at one extremity, and sewn to a metal ring about five inches in diameter at the other, is effective and portable. The exact dimensions will, of course, depend upon the size of the lens; the ring should be hinged to a light metal rod. Blinds can be screwed into the camera-front either above or below the lens. When an instantaneous shutter is to be used in front of the lens, the funnel must be attached to the shutter.

In photographing brightly-lighted subjects, or with objects near the camera which reflect much light into the lens, the want of some protection is a frequent and unsuspected cause of fogging and weak pictures. The short exposures required with gelatino-bromide plates, and the facilities afforded by their use for photographing moving objects, has caused the introduction of many so-called instantaneous shutters. Those selected for notice are in general use, and though more imperfect, all are more or less effective, and show much ingenuity in their construction. The drop shutter is the simplest of all, as it is the cheapest and most rapid; the drawback to it is that it is bulky in size, and the rapidity cannot be greatly varied for different lengths of exposure without making the shutter very long, and consequently more cumbersome. In the flap and drop-shutter combined, the flap is raised for exposure in the usual way, and when it is fully open, the action releases a drop-shutter, which instantly closes, the lens being drawn rapidly down by means of an elastic band. This shutter works rather stiffly, and is in consequence liable to shake the camera; it seems on the whole to possess no advantage over the simple drop.

Jackson's shutter is an ingenious contrivance; it has a pair of flaps connected by a light metal bar; these flaps move across the lens in opposite directions, so that in making the exposure, the shutter opens from the centre, and it closes from the sides. The exposure is rapid, depending on the tension of a rubber band; but it is not

* Continued from page 492.

so rapid as the drop-shutter. This instrument may be worked by hand when long exposures are required, the elastic being removed. This shutter is rather a large affair to fit in front of the lens, but is well adapted to go behind the lens.

Watson's snap-shutter is a neat contrivance, but does not give a very quick exposure, as the aperture is opened and closed by a single flap, which is drawn aside to expose, and drawn back again to close, the aperture; it takes less space to work in than the drop shutter, and is a good form of instrument for slow exposures, as the shutter may be left open any time; it works very easily. An ebonite drop-shutter by the same maker is very nicely made. Watson and Co. also sell the Addeubrooke shutter. With this instrument the exposure can be exactly timed: the standard size admits of twenty-seven progressive exposures from $\frac{1}{4}$ to $2\frac{3}{4}$-seconds. The instrument is necessarily heavy and expensive, £3 10s.: its only recommendation is that the length of exposure can be accurately timed. The patent shutter invented by Mr. Sands is also graduated for various durations of exposure from 1 to 6. These are not calculated by fractions of a second as in Addeubrooke's; it is, however, less bulky, and works more rapidly, owing to the fact that the shutter works between the lenses, and therefore has less space to travel, the opening to the shutter being no larger than the aperture in the diaphragm plate between the lenses. A more even exposure is obtained with the shutter working between the lenses than in any other position. The price of this shutter is necessarily high, but is somewhat less than Addenbrooke's.

A new shutter has lately been introduced by Marion and Co., called by them the "Ebonite Drop Shutter;" it is not, however, strictly speaking, a drop-shutter, the aperture being opened and closed by a flap which moves up and down by an arrangement of levers, the exposure in consequence being not very rapid. Attached to the shutter is Cadett's patent pneumatic apparatus. The exposure is made by squeezing a rubber ball which is attached to the shutter by a length of flexible tubing. On squeezing the rubber ball, the flap of the shutter is raised, and remains up till exposure is finished, when by removing the pressure from the ball a spiral spring acts as the lever, and the flap falls, closing the lens. The shutter is made of ebonite, and is very portable; it is fitted with removable leather collars, so that one shutter may be fitted to lenses of three or four different sizes. Cadett's pneumatic apparatus can be fitted to any of the shutters noticed above, the piston being made to fall on the trigger of the shutter. The duration of the exposure cannot, however, be controlled by the operator. The special feature in Marion's shutter is that an exposure of any length may be given by means of the pneumatic ball. When ordering a shutter, of whatever kind, the diameter of the wood of the lens should be given.

Cases of leather or canvas are made for carrying cameras and slides, and afford protection in travelling, but add to the weight to be carried. If the photographer intends to carry his own camera, it is a good plan to wrap the camera and slides in a piece of waterproof material, and fasten round them a pair of light straps with handle. The lens is conveniently carried in a leather case with straps to pass over the shoulder.

The selection of a good stand is somewhat difficult. We want a stand that shall be rigid and light, and high enough to enable us to focus without stooping; most persons prefer a folding stand, as more convenient to pack. A stand for a whole-plate camera to answer these requirements usually weighs about three and a-half pounds, a considerable addition to the weight of one's kit. The most rigid kind of stand is that in which each leg is made of two pieces, with a metal struck between them, the legs being attached to a metal top. This form affords six points of support to the top, and the struts make the legs very stiff. When each leg is in one piece, or in two pieces fixed at the same point to the top, the staud is always more or less shakey. The sliding-leg stands are open to this objection, though in many respects more convenient. When rapid exposures are to be given, the rigidity of the stand is of far more consequence than in the case of long exposures. The camera is attached to the stand by a movable screw, which is very apt to be mislaid or left behind when taking out the camera; a screw-hole should be tapped in the top of the stand, in which the screw may be screwed when not in use.

SUBSTITUTES FOR GROUND GLASS.

A good substitute for finely-ground glass, as a focussing-screen, is often needed, especially by the out-door photographer, who may be many miles, or hundreds of miles, from any place where such an article can be obtained.

The various kinds of "matt" varnish rarely give a fine enough grain; white wax dissolved in benzole is said to give a very satisfactory surface for focussing, but we have never tried it.

A piece of plain glass coated with ordiuary hard negative varnish may be rubbed with flour emery and oil by means of cork, until a fine ground glass surface is produced, but it takes some time to do it, although not nearly so long as would be necessary to produce the same effect on bare glass.

A gelatine emulsion plate, slightly exposed to light, developed and fixed, is an excellent focussing medium. But it may be wished to abolish glass altogether, and substitute some lighter and less fragile material.

For small sizes—say up to $4\frac{1}{4}$ by $5\frac{1}{2}$—mica ground with flour emery may answer well, but it is difficult to get mica free from defects, although it can be obtained of suitable quality; and for sizes larger than the above it would hardly be stiff enough, even if it could be obtained sufficiently homogeneous and transparent.

There is a kind of tracing paper in the market known as "French vegetable," which optically leaves little to be desired; but as it possesses no stiffness, it must be damped and pasted on a frame to make it "taut." Care is required not to make it too wet, or it will split in drying. It may be stretched on glass by wetting it and pasting the edges.

Tracing cloth has been used, but it is not sufficiently transparent, and its grain is too coarse. We have an idea that the fine oiled silk sold for surgical purposes might make a good focussing-screen, if stretched on a frame, but have never tried it.—*Photography.*

A NEW SENSITOMETER.

BY PROF. G. W. HOUGH.*

Various methods have been employed for ascertaining the sensitiveness of photographic plates, but we do not know that any hitherto used are capable of giving directly the sensitiveness as referred to any convenient standard. The use of blackened gelatine films may give sufficiently reliable results, but, from the nature of their construction, no two instruments will be precisely alike, and even in the same instrument there is no definite relation between the different parts of the scale.

The use of a series of tubes having unequal areas might answer under certain conditions, but such an apparatus would be complicated. I imagined that a single long tube—a stove-pipe, for example—in which was arranged a series of numbers at different distances from the opening, would solve the problem; but on examining such a device, it was at once concluded that it would not answer the purpose, unless the source of light and the camera were placed at a considerable distance from the opening.

It occurred to me that if a perforated disc was made to revolve in front of a scale of numbers, the light received by each would be directly proportioned to the angular opening in the disc. To illustrate, suppose we have a semi-circular disc, fig. 1, which is made to revolve rapidly, then any number covered by it when in rotation would receive only one-half as much light as one outside of its circumference. If the disc revolves with sufficient speed, both numbers will be constantly visible to the eye, but one will receive only one-half as much light as the other. On this principle is based the sensitometer about to be described. In our first experiments we constructed a snail on a scale of one to twenty, so that the figure 1 should receive one-twentieth of the whole light, 5 five-twentieths, &c.

* Communicated to *Photography.*

It was soon found, however, that the scale was too short for accurate determination of sensitiveness; since, when the proper exposure was made for a fully-timed negative, the whole scale was photographed. Our second snail was on a scale of 1 to 50; in this case also a large part of the scale was shown in the negative, both for collodion and emulsion plates.

Fig. 1.

In order to get a longer scale in a compact form, an opening was made in a cardboard disc, fig. 2, based on the ratio of one to five hundred, starting with 100 or one-fifth of the light entering the camera. For the upper part of the scale, from 100 to 30, only every tenth number was inserted; below 30 the numbers decrease by units.

The opening in the disc, fig. 2, is not drawn to scale, but any

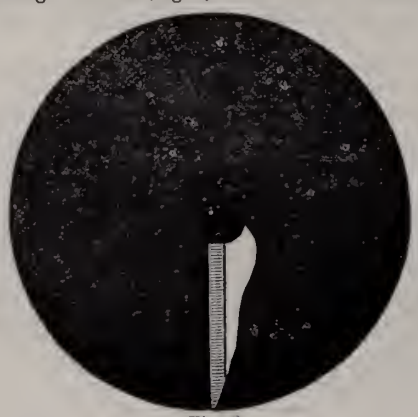


Fig. 2.

one may easily construct the opening for any scale desired. For the beginning of my scale the angular opening is 72 degrees, equal to one-fifth the whole light. For one-tenth of the whole light, the angular opening will be 36 degrees at that point, and for one one-hundredth of the whole light the angular opening will be 3·6 degrees, &c.

The following is the scale. The numbers as they now stand represent the time of exposure. It may, however, be reversed so as to give sensitiveness directly.

100
90
80
70
60
50
40
35
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

Now when the disc is put in rotation, and an exposure is made, each number developed shows at once the amount of light it received. If the last number visible was 5, the light equivalent for that number would be $\frac{5}{500}$ of the light employed. If the full aperture of the lens was used, and the time of exposure was ten seconds, the equivalent exposure for the figure 5 would be $\frac{10\times5}{500}=0{\cdot}20$ sec. We will suppose a similar plate is exposed, with the aperture of the lens reduced to 1·15 of the area, the time being the same. In this case the last number printed should be 75 of the scale. The light equivalent will then be $\frac{75}{500}\times20\times\frac{1}{1{\cdot}5}=0{\cdot}20$ sec. Having ascertained by a number of experiments the time required for the last number which can be seen, for any standard plate, the relative sensitiveness of any other can be ascertained. In the example given above, we will suppose the plate exposed was wet collodion, of which the light equivalent was 0·20 sec. In case the sensitiveness of an emulsion plate is wholly unknown, we may expose for the same time and with the same stop as was used before; suppose in such an experiment the last number printed was 6, then the light equivalent would be $\frac{6}{500}\times20\frac{1}{1{\cdot}5}=\frac{1}{6{\cdot}2}$ sec. As the collodion plate gave $\frac{1}{5}$ sec. the emulsion plate is twelve times as rapid.

If another plate shows the number 4 under the same conditions, its light equivalent would be $\frac{1}{9{\cdot}4}$ sec., or 19 times more rapid than the standard. In order to secure more accurate results, and also to assist in development, it is preferable to give approximately the correct exposures for the matter outside the scale; then the last numbers visible will fall near the middle. In this case any error of reading would not materially affect the result. The apparatus which we have used is simply a blackened card-board disc eleven inches in diameter, having a suitable opening, and rotated by a Yankee-clock movement. A scale of numbers, written with Indian-ink on white paper, is placed underneath it.

The disc makes about two revolutions in one second; but the speed of rotation is a matter of no consequence. With this simple device the relative sensitiveness of different plates is readily ascertained within five to ten per cent. from a single exposure.

In comparing dry plates by different makers, we used the pyro developer (Cramer's formula). The same strength of developer was used for all, and the plates were left in the tray for five minutes, in order to carry the development as far as it would ever be required in actual work.

The following experiment will indicate the working of the apparatus, using the same stop, and giving the same time. Four different brands of commercial plates were successively exposed, and then developed. The last numbers visible in the scale were, 10, 8, 6, 10.

In this example the relative sensitiveness of the plates is shown directly by the numbers 10, 8, 6, 10; the plate showing 6 being $1\frac{3}{3}$ times more rapid than those showing 10.

Commercial plates by nine different makers were compared with the wet collodion plate with the following results:—

The sensitiveness of the collodion plate being 1, the following numbers indicate the rapidity of the emulsion plates:—21, 20, 18, 16, 16, 14, 13, 13, 13.

An inspection of these numbers indicates a good deal of difference in the speed of plates.

It may be desirable to give some idea of the time of exposure which is necessary according to these numbers.

Now the collodion plate required for the minimum exposure one-half second, with the full opening of a Darlot No. 1 Rapid Hemispherical, to make a negative of a brick building or a well-lit landscape. Ordinarily, however, we give one second, in which case the plate is fully developed inside of thirty seconds.

On the basis of one second an emulsion plate having a speed of 20, when exposed on a similars ubject, should have not more, than 1-20 second with the full aperture of a Darlot No. 1 lens. In order to approximately secure a correct exposure it is necessary to use the smallest stop (3 mm.) and simply uncap. For the slower plates the 5 mm. stop may be used, and the lens simply uncapped.

These times refer, of course, to a well-lit out-door subject when there is sunlight.

With this form of sensitometer the relative intensity of the light at different times, or in different places, can easily be ascertained. It is simply necessary to expose a plate for a given time, and note the last number developed. A similar plate exposed in the same way at any other time or place will show a certain number, and the intensity of the light will be directly proportional to the numbers.

It has been stated that if a plate is exposed to a small amount of light previous to being used, it becomes more rapid. A simple experiment was made to ascertain whether the statement was true.

An emulsion plate was cut in four pieces. One was exposed without seeing light; the others had respectively, ten seconds', thirty seconds', and sixty seconds' exposure through the red-glass window of the developing-room before being used. The four pieces were all developed together. The one which was submitted to the red light for sixty seconds flashed right out like any over-exposed plate; then the others in proper order. All

were left in the developer for five minutes; when fixed, the first was found buried under a dense fog, so that only a portion of the scale could be read. The second showed considerable fog, and the third a trace; the fourth, of course, was perfectly clean. The numbers shown in the three pieces were precisely the same—if anything, a little advantage in favour of the piece which was handled in the darkness. The explanation of the foregoing belief is simple. A plate which has been submitted to other light than that belonging to the exposure will necessarily begin to develop quicker, but there will not be as much film left for the negative. Whatever light has been on it, either in its manufacture or elsewhere, will impair its usefulness in proportion to the amount of light it received.

The question occurred to me whether it was possible to use the foregoing method and mechanism for an absolute standard of sensitiveness, so that plates tested in Chicago and London should be directly comparable. With a lens of given area and focal length this may be readily accomplished, provided we have a standard light. The electric light might be used, but there would be a good deal of trouble and some uncertainty in determining its intensity. The same would be true of the magnesium light or any other. On the whole, I believe a wet collodion plate would be the most convenient standard, and could be made to give comparable results within small limits of error, provided a uniform standard was adopted for the collodion and the bath.

This sensitometer may be made to give absolute results without much difficulty.

Let any scale of numbers from 0 to 100 be photographed or painted on clear glass. The plate to be tested may then be placed behind it, to make a contact negative. In front of the scale the snail or perforated disc may be rotated, so as to give each number its proper amount of illumination; the light being a standard candle at one foot distance.

If the time of exposure be 100 seconds, and the last number visible in the negative 10, the equivalent exposure will be,

$$100 \times \tfrac{10}{100} = 10 \text{ seconds.}$$

If another plate under the same circumstances shows the number 8, its equivalent exposure will be 8 seconds. In other words, the apparatus will give the actual time required for the light of one candle at one foot distance to make a legible record, and this time is the standard of sensitiveness; the only source of error will be in the standard candle.

THOUGHTS BY THE WAY.

BY ONE WHO THINKS.

"There's a chiel amang us takin' notes,
An' faith he'll prent 'em."

Those who commence this paper with the hope of learning something new, of picking up a fresh developing formula, or of obtaining the latest "safe light," will find themselves sadly disappointed, and I warn them to desist reading at once. I am simply committing to paper thoughts bearing on photography that have passed through my mind when reading the photographic papers, and when engaged in my work. These will, I fear, sometimes savour of sentiment; but, to my thinking, a man without some sentiment is little better than a bagful of sawdust: he must first feel the poetry there is in nature and in human life, before he can pourtray it to his fellow-creatures. "In the Gloamin'," "When the Day's Work is Done," "There is Sorrow on the Sea," would never have been made had not their authors possessed the power of feeling the pathos existing in all around us. I am a professional photographer, and I think my initiation into the profession would have disgusted the most enthusiastic. In the smoke and fog of a huge city, I commenced my instruction with a large club firm. The class of work disgusted me, but in shop windows I saw prints by men of mark rendering some beauty spot with exquisite delicacy, and I know there was a power yet to be reached. I worked hard, and was rewarded by gaining the ability to make the soft and airy pictures I had so much admired.

There has been much said about over-exposure and restrainers, but I cling tenaciously to the belief that there should be only one exposure, and that the correct one; an error on either side causes the loss of that beautiful gradation that is so characteristic of gelatine plates, for there is a beauty in the gradation of a dry-plate (properly exposed that I have never seen in a wet plate. When photographers learn to give correct exposures, and to modify the developer according to the requirements of the view to be represented, then, and not till then, will dry plates assert their supremacy over wet.

I cannot speak too highly of first soaking the plate in pyrogallic, bromide, and water, and then developing by small doses of ammonia, added at intervals; the image is thus completely under the control of the operator, and is gradually built up, it seems, more in the *body* of the film, and less superficial than does one where the full strength developer is applied at once. Before adopting this course, I really got a negative to please me. I never care how long a negative takes me; half-an-hour is the time I usually spend in developing one, but when finished am rewarded by great brilliancy and gradation. When at work in the field I am most careful to screen the lens during exposure, as in my opinion this helps to give a brilliant negative. My screen is of the simplest, being two light strips of blackened wood, which I lay across the top of the camera, and which project a suitable distance in front; over these, when ready to expose, I throw the focussing cloth, and as this falls down on either side the lens is effectually screened.

In case of known under-exposure, where drop shutters are used, for instance, I always give a preliminary soaking in dilute ammonia and water, and use a good proportion of bromide. My advice with respect to developing, is: get a good formula, and work at it until you thoroughly understand it; do not try every developing formula you may see published; they are all good when well understood, and without being understood the best is useless. There are countless changes to be rung on a very simple formula; and remember you do not want three grains of pyro to the ounce of water for every subject you develop.

I remember, before commencing to develop dry plates myself, frequently standing by one of my principals when he was developing, and being amazed at his *modus operandi*. He held the opinion that dry plates had great latitude of exposure (truly a comfortable opinion!) Anywhere between one and twenty seconds ought to give a good result, he thought, where perhaps the correct exposure was five seconds. Arrived in the dark-room, he would proceed to develop, his light that of a single thickness of what had once been orange paper; the developer would then be mixed, probably the remains of some three or four different developing formulæ. If under-exposed, he would add undiluted ammonia ·880 *ad libitum*; if over-exposed, some bromide would be dashed in from the stock bottle. Then commenced the "pushing-up" process (this, he explained to me, was to give the print the vigour and character of a wet print), and when finished, I had a negative to print from that in dull weather I didn't get half-a-dozen prints from in a day. The negative, as may be guessed, was not a success, but then, "arn't you surprised at such a well-known firm sending out plates like these? Will try some one else's!" And so I suppose he is still trying some one else's. This was no second-rate artist, according to public estimation.

For many reasons I am compelled to use commercial ready sensitized paper, but for beauty of result, think none can equal paper sensitized at home. For a long time I had the greatest difficulty in toning the commercial paper; tried the acetate, borax, phosphate, and various other baths, but all in vain. At last I settled down to a tungstate of soda bath, and with care got very good tones, and great uniformity. I always add a little ammonia to the washing-water, which greatly accelerates the toning.

These are my "thoughts by the way." That there is nothing new in them, I am only too well aware of, and for which fault I am quite ready to apologize.

Correspondence.

THE INTERNATIONAL EXHIBITION AT THE CRYSTAL PALACE.

DEAR SIR,—The absence of exhibits from the majority of our first-class photographic artists from the above exhibition was most remarkable, but more remarkable still the manner of adjudicating, and, if such a system of awarding medals be followed up, will disgust deserving artists, and materially lessen their desire to compete for such sham and questionable honours. Of course it could not be looked upon as a representative photographic exhibition, but it won't do to give medals away indiscriminately, or make them cheap, or they lose their charm.

Although there was not a strong display of talent, surely such men as Messrs. King, Faulkner, &c., were second to none in all the photographic productions displayed, which must have been observable to any possessed of judgment. And again, why should the distinction be made of judging Mr. King's pictures by gentlemen capable of giving an opinion, when the gold medal was awarded by those who could not be expected to come to a proper conclusion? And if this sort of thing is allowed to proceed, gold medals will be at a discount.

One could not but be struck, in passing Section IV. of the Exhibition, at seeing the frames scattered here and there, reminding a visitor forcibly of advertisement frames at a station.

Under your heading "Talk in the Studio," where, quoting the scattered exhibits in Section IV., and their being adjudicated upon by judges really not qualified, you state you are unable to account for the reason. But that there is a motive must be transparent even to the most unbiassed, and unless competitions of the kind are carried on with a straightforward principle, medals will not be sought after or valued much by our leading men.—Respectfully yours, C. A. GREGORY.

Froddington, Somers Town, Southsea.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 31st ult., Mr. W. E. DEBENHAM in the chair.

Mr. S. C. Salmon was elected a member of the Association.

Mr. A. COWAN exhibited an arrangement of standard diaphragms he had devised to suit a combination, or any other series of lenses. This ingenious contrivance is obtained by causing two diamond-shaped openings in plates of ebonite to pass each other, gradually diminishing the aperture until it is completely covered. The position is on the camera front, half the combination being screwed into a flange in front, and the other half at the back, so that the stops may work between the lenses. Below is an index plate, around which is marked a scale of standard stops for all the focal lengths of lenses with which it can be used. Starting at full aperture, by means of a trigger having a cam action, operating to raise one shutter whilst lowering the other, a given mark in the index is reached corresponding to (say) $\frac{f}{32}$; a clamping screw then secures the shutters in that position, or rather prevents a larger aperture being employed when the exposure takes place; the exposures being made by causing a button suitably fixed to traverse in a slot as shown in the accompanying figure.

The CHAIRMAN said it was certainly very ingenious; he was sorry Mr. Cowan had not adopted the round form of aperture instead of the square.

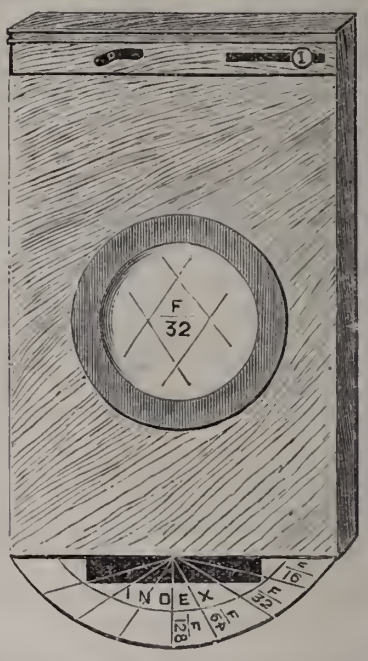
Mr. COWAN replied that the present form was easier to make, and from repeated experiments he saw no disadvantage; in some cases a slight elongation was advantageous; circular diaphragms, as in microscopes, would be as costly as the lens.

The CHAIRMAN differed as to the results obtained; he thought an approximate difference in definition would be as four seconds to five in favour of the round stop.

Mr. COWAN maintained that for all practical purposes one form was as good as the other.

A Member having suggested its suitability for the dissolving lantern,

Mr. COWAN said he had employed it for that purpose with excellent effect.



Mr. W. COLES showed the result obtained by him on an opal plate handed to him by Mr. Ashman at the last meeting; the print was exceptionally good.

The CHAIRMAN enquired whether it printed quicker or slower than an ordinary silver print?

Mr. COLES had not noticed that carefully; he found toning took longer, and he employed five grains of borax to each ounce of toning bath.

Mr. W. H. PRESTWICH found they printed very much quicker than ordinary sensitized paper.

Mr. W. COBB showed a sample of corrugated paper suited for packing dry plates; it was not delcterious, and was very cheap. He also passed round some 10 by 8 prints of the recent procession on its way to Hyde Park.

A discussion then arose on the advantage or otherwise of the glass in studios being partially obscured with tissue paper or other media, and the Chairman pointed out how it was often possible to get a similar effect to that of a passing cloud by stippling a few feet of the glass roof with a mixture which permitted easy removal; while another member showed the advantage gained by glazing those portions which are obstructed in confined situations with ground glass, and causing light to fall on its surface by means of reflectors. The principal objection urged was the largeness of the spot in the eye caused by the reflecting surface below the line of sight. This, however, was shown to be avoidable by interposing screens when necessary. Some gave preference to glazing entirely with ground glass, and others to rolled or fluted glass similar to the kind known as "Hartley's."

Talk in the Studio.

THE PHOTO-CHEMICAL LABORATORY OF THE NEW TECHNICAL HIGH-SCHOOL AT BERLIN.—The accommodation at the Technical High-School in Berlin has long been recognised as inadequate to the requirements of the present day; but in the new building ample provision is made for photographic work on a considerable scale. One building in connection with the Technical School comprises the chemical laboratory, the metallurgical department, and the photographic laboratory. On the ground floor is a machine room which contains a five-

horse power gas engine and a Siemen's dynamo capable of producing six arcs of 1,200 candles each; the conductiug wires passing up into the studio on the third floor, where the photographic work can go on iudepeudently of daytime or weather. A museum and exhibition room is also provided, and as a nucleus for a collectiou, Professor Vogel has presented the various specimens which he has so iudustriously collected during the past quarter of a century. Conveuieut rooms are provided for the various branches of photographic work, such as solar and mechanical printing, gelatino-bromide, photo-spectrography, and photometry. A conveniently fitted lecture and demonstration room has also been fitted up.

Dry Plates Specially Adapted for Stripping.—A special dry plate, from which the film can be readily stripped, is made by Messrs. Werth and Co., of Frankfort, it beiug merely necessary to set the negative in a horizontal positiou, and to pour on sufficient of the following gelatine solution to form a layer about a sixteenth of an inch thick :—

Gelatine	60 parts
Water	220 „
Glycerine	10 „

When the compositiou is dry it is easy to strip off the film by lifting the edges with the point of a knife. Plates for strippiug can be readily made by rubbing the glasses with powdered Freuch chalk, and collodiouising before coating with emulsion. All excess of French chalk should be dusted off, and the collodion should be dry when the plates are coated with emulsion.

A Frenchman's Dream of Electricity Abolishing Night.—*La Vie Moderne* amuses its readers with one of those visions of the future which have been in vogue since science began to astonish the present age with its marvellous performances. The coal mines were giving out, and their use was almost discontinued except for mauufacturers; gas had become extraordiuarily dear, and an American had conceived the project of erecting a tower 350 metres high on the open space in front of Notre Dame, from whose summit an enormous nickel-plated reflector 187 meters in circumference should shed down a flood of light over all Paris that would simply abolish night. On the top of a column a dynamo was to be required merely to keep the gigantic carbons at due distance from one another; at the base in great cellars were 2,000 elements, each couple of which was to absorb daily 1,200 kilograms of acid. In six months it was done, and Paris awaited the first lighting with an interest brightened by the news that three men, who, during one of the experiments being in the focus, had been melted and evaporated, and that the American chief engineer, M. Attison, who was taking a spectroscopic observatiou, had been fortunate euough to note the lines of the human spectrum—or spectre. Their expectations were not disappointed. A flood of light poured over the city, and (unlike, we must say, any electric light which we have succeeded in producing in our country) it turned round corners, entered the houses, went up stairs, and lighted not merely the parlours, but the passage-ways. But now came a difficulty. Paris always keeps late hours, but it ends by going to bed; those who amuse themselves moderately seek home at midnight; those who try hard to enjoy life leave off at three or four at latest. But why leave off at all in broad daylight, or perhaps we should say, in broad nightlight? And how could one sleep without darkness? For a few days Paris was perplexed. It lost its reckoning of time entirely, and at last it was found necessary to fire a morning and evening gun in every arrondissement to let the people know when the change was made from artificial to natural, and from natural to artificial sun, "and the Lutetian race, constantly bathed in living light, acquired a force, a beauty, an energy worthy of the Homeric ages."

Photo-Micrographs of Bacteria.—In the report of the Surgeon-General of the Navy for 1881 (Washington, 1883, p. 70) are to be found photo-micrographs, and a short account of a comma-shaped bacterium, a rather unusual form, observed by Surgeon J. H. Kidder in water through which air had been aspirated (summer of 1881), and in well-water near Washington (1883). Until we have more precise descriptions of Koch's cholera bacillus than are yet available, it will be judicious for microscopists to bear in mind, in case of the appearance of cholera on this side of the Atlantic, that similar forms have been found in water when no case of cholera was known to exist. Dr. Kidder supposed the form which he photographed to be the same as, or very similar to, that noted and figured by Billroth (*Untersuch. über coccobacteria septica*, Berlin, 1874, taf. ii. *B.*, *C.*), found in the droppings from an imperfect water-faucet in his work-room. —*Science.*

In Bathing Costume.—It is reported that photographs in bathing-costume are now called for by Philadelphia and New York belles.—*Waltl's Monthly.*

Printing Magnetic Curves.—Mr. A. D. Stephens, writing in the *Electrician*, says:—"While making some experimeuts in magnetism several months ago, I made use use of a method of preserving the diagiams of 'magnetic lines of force' obtained by the use of iron filings, which was new to me at that time, and which is extremely simple and effective. The process is as follows :—The figures are formed by the filings in the usual manner, but on a sheet of prepared blue print paper (see page 483) which is exposed to the sunlight as soon as the figures are formed. After a few moments' exposure, the paper is washed in clear water. If care is taken to have the light strike the paper as nearly normal as possible, the print obtained will be very sharp and clear.

The Vitiation of Air by Different Illuminants.—The following table, prepared for the *Engineering and Mining Journal*, shows the oxygen consumed, the carbonic acid produced, and the air vitiated by the combustion of certain bodies burnt so as to give the light of twelve standard sperm candles, each candle burning at the rate of 120 grains per hour.

Burnt to give light of 12 candles, equal to 120 grs. per hour.	Cubic feet of oxygen consumed.	Cubic feet of air consumed.	Cubic feet of carbonic acid produced.	Cubic feet of air vitiated.	Heat produced in lb. of water raised 10° F.
Cannel gas	3·30	16 50	2·01	217 50	195·0
Common gas	5·45	17·25	3·21	348·25	278·6
Sperm oil	4·75	23·75	3 33	356·75	233·5
Benzole	4·45	22 30	3·54	376 30	232·6
Paraffine...	6·81	34·05	4·50	484·05	361·9
Camphene	6·65	33·25	4·77	510·25	325·1
Sperm candles	7·57	37·85	5·77	614 85	351·7
Wax	8 41	42·05	5·90	632 25	383·1
Stearic	8 82	44·10	6 25	669·10	374·7
Tallow	12·00	60·00	8·73	933·00	305·4
Electric light	none	none	none	none	13·8

Photographic Club.—At the next meeting, on August 13th, the adjourned discussion on the "Effect of Colour Media on Silver Prints" will be concluded. On Saturday, 9th inst., there will be an out-door meeting at Blackwall Pier. The members will meet at London Bridge Pier in time for the first steamer after 2 p.m. Late comers may proceed by rail to Blackwall from Fenchurch Street.

To Correspondents.

*** We cannot undertake to return rejected communications.

Frank Colbourne.—1. You cannot be at all sure of being able to remove the spots; but sometimes a careful treatment of the whole negative with a solution of cyanide of potassium—say, ten grains to the ounce—will answer. 2. To prevent this, take care that your negatives are very thoroughly washed and perfectly dried before being varnished. Your sensitive paper and the padding of the printing-frame should always be perfectly dry.

Belfast in Trouble.—If your camera has a rising front, you will get over your difficulty by sliding it upwards about an inch; if not, you must tilt the camera and overcome the consequent distortion by pushing the top of the swing-back in towards the lens—if, indeed, your camera is provided with a swing-back—otherwise you must be contented with a distorted picture in the first instance, and obtain a corrected one by copying it with the top portion rather nearer to the lens than the bottom. The correct angle for placing it in relation to the lens can only be determined by experiment, and a small stop must be used.

Beginner.—You should obtain Abney's "Instructions," of which a new edition will be ready in a few weeks.

Carl Norman.—Any maker of photographic apparatus will construct it for you; but it is not an ordinary stock article, because few persons care to use it.

Amateur.—They were not carried, but walked; look again at the construction of the sentence.

South Devon.—We are inclined to think as good a one can be made, but cannot offer any opinion as to whether you could obtain it. The work is difficult to one not engaged in it constantly.

A. C. A.—The only perfectly satisfactory way is to use the black varnish, and in the case of astronomical photographs, this is invariably done. 2. About ten grains to the ounce. We think not, 3. You are quite right; most prefer a light tending towards orange or greenish-yellow.

FRED. E. BELLAMY.—1. The back combination of a portrait lens is not suitable for view work, but the front combination answers very well if reversed and mounted in the back of the tube, so that the stop is in front of it. It is also possible to use the front lens with the stops behind; that is to say, simply remove the back combination. In the latter case the distortion is of the "pin-cushion" kind. 2. About one-fifth of the focal length. 3. Ordinary collodion is used. Warm a glass plate, and rub it over with a lump of beeswax, after which polish off all excess with a piece of flannel. Next coat the plate with collodion, and allow it to dry. The print and collodionised plate are now immersed in a warm solution of gelatine—say, one in ten or fifteen of water—and the plate is brought out of the solution with the print resting evenly, face downwards, on the collodion surface. Perfect contact between the collodion film and the picture is now ensured by gently stroking the back of the paper with a squeegee; that is to say, a strip of rubber mounted scraper fashion in the edge of a piece of wood. Now allow the print to dry, raise the edge all round with a pen-knife, and strip from the glass.

A. G. B.—1. Either a square or an oblong. 2. About twice the diameter. 3. The material should not be stiff, and the sleeve ought to be no longer than is necessary for easy manipulation—let us say three or four diameters. 4. Equally well either way. 5. It is merely a case of educating the hand, and requires rather practice than directions.

H. P. V.—1. We fear it is useless, but you might try on the assumption that it contains about half its weight of the unaltered salt. 2. See answer to Frank Colbourne.

W. G. B.—It is one of the coal tar colours, and can be obtained from Messrs. Hopkin and Williams, of Cross Street, Hatton Garden.

EDWARD KUNKLER.—Messrs. Chance and Co., Glass Makers, Birmingham, is sufficient address. 2. See answer to W. G. B.

JANOS.—Probably you admit too much light into your dark-room.

J. Y. BRETT.—The results are very satisfactory, and we are glad to find that your own experience confirms the observations of others.

ANXIOUS.—You would certainly do yourself no harm by coming up to London and calling on some of the leading photographers: but without knowing somewhat more of your qualifications, we can hardly judge of your chance of success.

J. HOWSON.—Your friend cannot claim the negative, the ownership of which rests in the photographer.

The Every-day Formulary.

THE GELATINO-BROMIDE PROCESS.

Emulsion.—A—Nit. silver 100 grains, dist. water 2 oz. B—Bromide potassium 85 grains, Nelson's No. 1 gelatine 20 grains, dist. water 1½ oz., a one per cent. mixture of hydrochloric acid and water 50 minims. C—Iodide potassium 8 grains, dist. water ½ oz. D—Hard gelatine 120 grains, water several oz. When the gelatine is thoroughly soaked, let all possible water be poured off D. A and B are now heated to about 120° Fahr., after which B is gradually added to A with constant agitation; C is then added. Heat in water bath for half an hour, and stir in D. After washing add ¾ oz. alcohol.

Pyro. Developer.—No. 1—Strong liq. ammonia 1½ oz., bromide potassium 240 grains, water 80 oz. No. 2—Pyro. 30 grains, water 10 oz. In case of an ordinary exposure mix equal vol.

Iron Developer.—Potassium oxalate sol. (1 and 4) 80 parts, ferrous sulphate sol. (1 and 4) 20 parts, dist. water 20 parts. To each 4 oz. of the mixed developer add from 5 to 30 drops ten per cent. sol. potassium bromide, and 30 drops sol. sodium hyposulphite (1 and 200).

Substratum or Preliminary Preparation.—Soluble silicate of soda 1 part, white of egg 5 parts, water 60 parts. Beat to froth and filter.

Fixing.—Sat. sol. of sod. hypo. 1 pint, sat. sol. of alum 2 pints, mixed.

Cowell's Clearing Solution.—Alum 1 part, citric acid 2 parts, water 10 parts. Edwards makes this sherry coloured with perchloride iron.

Eder's Method of Intensification.—The negative is whitened by soaking in sat. sol. of mercuric chloride, and after thorough rinsing immersed in potass. cyan. 10 parts, potass. iod. 5 parts, mercuric chloride 5 parts, water 2,000 parts. As film becomes dark brown, the actinic opacity is increased; but prolonged action causes brown tint to become lighter, until at last the negative is no denser than at first.

Fol's Backing Sheets.—A chromographic paste is prepared with gelatine 1 part, water 2 parts, glycerine 1 part, and a very small addition of Indian ink. Strong paper or shirting is coated, and the sheets are laid, face downward, on waxed glass to set. Press to back of glass plate.

THE WET COLLODION PROCESS.

The Nitrate Bath.—Water 14 oz., nit. silver 1 oz., nitric acid 1 drop. Before using coat a small plate, and immerse it for 20 minutes.

Cleaning Preparation for New Plates.—Alcohol 4 oz., Jeweller's rouge ½-oz., liquid ammonia ½-oz.

Film-removing Pickle for Old Plates.—Water 1 pint, sulphuric acid 4 fluid oz., bichromate potassium 4 oz.

Negative Collodion for Iron Development.—Alcohol 1 pint, pyroxyline of suitable quality 250 grains, shake well and add ether 2 pints, *Iodize this by mixing with* one-third of its volume of alcohol ½ pint, iod. ammon. 80 grains, iod. cadm. 80 grains, brom. ammon. 40 grains.

Normal Iron Developer.—Water 10 oz., proto-sulphate iron ½ oz., glacial acetic acid ½ oz., alcohol ½ oz. The amount of proto-sulphate iron may be diminished to ¼ oz. when full contrasts are desired, or increased to 1 oz. when contrasts are unduly marked. With new bath quantity of alcohol may be reduced to ¼ oz.; but when bath is old more is wanted.

Substratum.—Whites of 2 eggs well beaten, 6 pints of water, and 1 dr liq. ammon.

Intensifying Solution.—Water 6 oz., citric acid 75 grains, pyro. 30 grains. When used, add a few drops of the silver bath to each ounce.

Lead Intensification.—After neg. washing, immerse in dist. water 100 parts, red pruss. potash 6 parts, and nit. lead 4 parts. When it is yellowish white wash and immerse in liquid sulphide ammon. 1 part, water 4 parts.

Fixing Solution.—1. Potass. cyanide 200 grains, water 10 oz. 2. Sat. sol. of sod. hypo.

Varnish.—Shellac 2 oz., sandarac 2 oz., Canada balsam 1 dr., oil of avender 1 oz., alcohol 16 oz.

PRINTING PROCESSES.

Albumen Mixture for Paper.—White of egg 18 oz., 500 grs. ammon. chlor. in 2 oz. of water. Beat to a froth, stand, and filter.

Sensitizing Solution.—Nit. silver 50 grs., water 1 oz., sod. carb. ½ gr.

Acetate Toning Bath.—Chl. gold 1 gr., acet. soda 20 grs., water 8 oz.

Lime do.—Chl. gold 1 gr., whiting 30 grs., boiling water 8 oz., sat. sol. cbl. lime 1 drop. Filter cold.

Bicarbonate do.—Chl. gold 1 gr., bicarb. soda 3 grs., water 8 oz.

Fixing Bath.—Sodium hypo. 4 oz., water 1 pint, liq. ammon. 30 drops.

Reducer for Deep Prints.—Cyan. potass. 5 grs., liq. ammon. 5 drops. water 1 pint.

Sensitizing Bath for Carbon Tissue.—Bichromate potash 1½ oz., water 30 oz., ammonia 1 dr., methylated spirit 4 oz.

Enamel Collodion.—Tough pyroxyline 120 grs., methylated alcohol 10 oz., ether 10 oz., castor oil 20 drops.

Mountant.—1. Fresh solution of best white gum. 2. Fresh starch.

Collotypic Substratum.—Soluble glass 3 parts, white of egg 7 parts, water 10 parts.

Collotypic Sensitive Coating.—Bichromate potash ½ oz., gelatine 2½ oz., water 22 oz.

Collotypic Etching Fluid.—Glycerine 150 parts, ammonia 50 parts, saltpetre 5 parts, water 25 parts.

Printing on Fabric.—Remove all dressing from fabric by boiling in water containing a little potash, dry, and albumenize with ammonium chloride 2 grammes, water 250 cubic cents., and the white of 2 eggs, all being well beaten together. A 70-grain silver bath is used, and the remaining operations are as for paper.

Cyanotype Printing.—Water 1 oz., red prussiate of potash (ferricyanide) 1 dr., ammonio citrate of iron 1 dr. Prepare and preserve in the dark. Float the paper and dry. Fixation by mere soaking in water.

VARIOUS.

Luckardt's Retouching Varnish.—Alcohol 300 parts, sandarac 50 parts, camphor 5 parts, castor oil 10 parts, Venice turpentine 5 parts.

Matt Varnish.—Sandarac 18 parts, mastic 4 parts, ether 200 parts, benzole 80 to 100 parts.

Encaustic Paste.—Best white wax, in shreds, 1 oz., turpentine 5 oz. dissolve in gentle heat, and apply cold with piece of flannel.

FERROTYPES.

Collodion.—Ammonium iodide 35 grains, cadmium iodide 25 grains cadmium bromide 20 grains, pyroxyline 70 grains, alcohol 5 oz., ether 5 oz.

Bath.—Silver nitrate 1 oz., water 10 oz., nitric acid 1 drop.

Developer.—Ferrous sulphate 1 oz., glac. acetic acid 1 oz., water 16 oz.

Fixing and Varnish.—Same as wet collodion process.

The Photographic News Registry.

Employment Wanted.

Improver and Assistant.—A. W., *Photo. News* Office.
Lady, to Spot and Colour.—K. S., 82, Claybrook-rd., Fulham.
Printer, first-class, 30.—J. E. Moore, 62, Thornhill-rd., Barnsbury.
Studio Assistant in Country.—F. W., 2, Royal-cres., Weston-super-Mare.
Lady as Improver.—A. G., 5, Heaton-villas, Heaton-rd, Peckham.
Assistant Operator & Retoucher.—H. S., *Photo. News* Office.
Printer, Toner, Vignetter.—H., 42, Lockton-st., Old Ford-rd.
Managing Printer, first-class.—Photo, *Photo. News* Office.
Operator, wet and dry.—C. O., 25, Duke-st., Bloomsbury-sq.
General Assistant, at 25s.—W. W., 13, South-ter, Halton, Hastings.

Employment Offered.

Printer, Vignetter, & Toner.—W. V. Amey, Landport, Portsmouth.
Negative Retoucher (Lady).—Adams & Scanlan, Southampton.
Printer, thoroughly competent.—F. Guy, 70, Patrick-st., Cork.
Lady (for 3 months) to work up.—Lambert, Weston & Son, Folkestone.
Spotter (Lady).—Lambert, Weston, & Son, Folkestone.
Assist. Oper. & Retoucher at 25s.—W. Mountain, 211, Clapham-rd.
Apprentice or Improver, with board.—T. Vipond, Grantham.
Lady of education in quiet business.—E. S., The Studio, Sutton.
Lady Negative Retoucher.—Adams and Scanlan, Southampton.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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CONTENTS.

"FULL APERTURE" OF LENSES.

THE "full aperture" of a lens is the largest aperture with which it can be worked to give what is considered a desirable amount of definition in a photograph. Correctly speaking, it is always the diameter of the largest stop used, or of the diaphragm cell: or, if the smallest combination of the lens be smaller than the cell, of that combination. This is, strictly speaking, the "full aperture:" but when we come to take the diameter of the opening of a lens for the purpose of calculating its rapidity, we have in certain cases to take something a little different from this as the aperture. The reason of this is, that in the case, for example, of a double combination lens, the light passing the front combination is somewhat condensed, and therefore a larger quantity of it passes through the diaphragm. This is due to its area alone. We may go over the various forms of lenses most commonly in use by photographers, and indicate what in each of these has to be taken as the "aperture" in calculating the rapidity of the instrument.

The single lens naturally comes first. This lens is never worked with a stop nearly the size of the lens, and when the stop is in front, as is usual, its diameter precisely may be taken as the "aperture." If the diaphragm be behind the lens, a certain correction has to be made which we will mention further on.

In a double combination lens, either of the portrait, rapid, symmetrical, or doublet pattern, if the lenses be of the same size as each other, and the opening of the stop or diaphragm cell be as large as the lenses, the diameter of the front combination is the aperture. When, however, the front lens is larger than the stop, or than the back combination, a correction has to be made.

There is a very neat mechanical or graphic method of doing this, which is, if we mistake not, due to the ingenuity of the late Mr. Dallmeyer.

The lens to be tested, and the camera, are placed in front of the window of a room which can be darkened by closing the shutters. A distant object is focussed. The focussing screen is replaced by a piece of cardboard in the centre of which is a pinhole. The shutters of the room are now closed, and behind the pinhole—that is to say, outside the camera—is held the flame of a candle. If we now observe the front combination of the lens we will see a circle of it illuminated by the light coming through the pinhole. The diameter of this will be a little greater than that of the stop, and may be taken as the "aperture."

Clever as this method is, it has one or two drawbacks. In the first place, the arrangement of darkened room, and so forth, is somewhat troublesome. In the second, the illumination of the wick is very feeble, and there is considerable difficulty in measuring it with accuracy.

Even a small error in the measurement is serious, as the rapidity of the lens varies as the square of the diameter of the aperture, so that any error in measurement means an error about doubly as great in the final result. There is a very simple method of getting at the correct aperture by calculations which we think will be found useful to many.

The back lens of the combination is unscrewed. The focal length of the front lens is now ascertained. It is not necessary to be very accurate in this; so long as there is no error which forms a considerable fraction of the whole focal length, we are near enough.

We may now state the following sum in proportion. As the focal length of the front lens *less* the distance from the front lens to the diaphragm: the focal length of the front lens:: the diameter of the stop: "aperture." To make this somewhat cumbrous statement plain, we will take an example.

A portrait lens has its two combinations, each 3 inches diameter. The diaphragm cell is $2\frac{1}{2}$ inches diameter. The distance between the front combination and the diaphragm cell is $1\frac{1}{2}$ inch, and the focal length of the front combination is found to be 16 inches. We now have the following:—

$$16-1\tfrac{1}{2} : 16 :: 2\tfrac{1}{2} : \text{"aperture"}$$
$$\text{or } 14{\cdot}5 : 16 :: 2{\cdot}5 : 2{\cdot}75$$

Therefore the "aperture" is to be taken as 2·15, or $2\frac{3}{4}$ ins. Here it will be seen that the correction is by no means inconsiderable, the ratio of the squares of 2·5 and 2·75 being somewhat greater than that of 5 to 6.

It might happen that on performing the following calculation we got a figure greater than that of the diameter of the front lens. This indicates that in spite of the fact that the fixed stop is a little smaller than the front lens in diameter, the latter is nevertheless to be taken as the aperture.

If the back lens is smaller than the front lens, the calculation is made in the manner just described, except that for diameter of stop we take diameter of back of lens; for "distance from front lens to diaphragm" we take distance from front lens to back lens.

This method is useful in calculating the rapidity of lenses of the orthoscopic pattern, and in these it will be found that the correction to be made is very considerable. The reason for this is, that in the first place there is a considerable distance between the lenses, and in the second place the front lens is a very powerful condensing one. In fact, it is of less focal length than is the whole combination, the back lens being of the dispersing nature, and partly counteracting the front one.

In triplet lenses, the diameter of the centre lens is taken for the diameter of the stop, and the distance from the front to the central lens is taken for the distance from the front lens to the stop.

As we have already said, it is necessary to make a correction even in the case of a single lens if the stop be used behind instead of in front of the lens. In this case, the correction is made precisely as for a double combination lens,

the single lens being of course considered as the front lens of the combination.

We may say that for practical purposes the only lenses in which it is necessary to make the correction are the portrait lens, the orthoscopic, and possibly the rapid rectilinear and symmetrical.

Tables have been given in our columns for calculating the diameters of stops of lenses according to the Parent Society's standard, the focal length being given. Here, too, it is, however, necessary to make a correction in the case of double combination lenses. To be correct, the stops must be cut as for a lens of somewhat shorter focal length than is the one we are actually cutting them for. To get the exact allowance to make, we may take the following proportions.

As the focal length of the front combination : the focal length of the front combination *less* the distance from the front lens to the diaphragm : : the actual focal length of the combination : the focal length from which to calculate the diameters of stops.

To revert again to our example, if a lens 3 inches diameter with front lens 16 inch focus, and with 1½ inch distance between the front lens and the stop, let us take the equivalent focal length of the combination at 11 inches, we now have the following :—

16 : 14½ : : 11 : the focal length from which to calculate the diameters of stops.

Or, 16 : 14·5 : : 11 : 10.

The last figure is not precisely correct, but it is very nearly so.

In the case we have taken, then, instead of calculating our standard diaphragms for the correct focal length of the lens—that is, 11 inches—we calculate them as for a lens of only 10 inches diameter.

ISOCHROMATIC GELATINE PLATES.

It is very interesting to note how much attention is now being given to the problem of reproducing coloured objects with the proper gradations of intensity by means of stained plates, and the circumstance that there is a constantly increasing demand for good photographic reproductions of paintings is doubtless one reason why so many persons are now engaged in working out the difficult problems of isochromatic photography.

It will be remembered that a short time ago (present volume, p. 327 and 370) we gave some particulars as to the experience of Professor Lohse, of Potsdam Observatory, with turmeric as a staining material for gelatine films, and it is interesting to take note of some more recent investigations made with yellow colouring matters by Dr. Lohse.

The following materials were tried among others. Orthonitrophenol, orthonitraniline, paranitraniline, metanitraniline, thymochinone, chrysophanic acid, quercitrine, diamidobenzole, hydrochlorate of diamidobenzole, amidoazobenzole, hydrochlorate of amidoazobenoole, nitrosodi methylanaline, picramic acid, Martin's yellow, and nitrate of chrysaniline.

In each case ·02 gramme of the colouring matter was dissolved in a hundred cubic centimetres of water, and ten per cent. of ammonia was added ; the plates being soaked in this solution and dried.

The results were very diverse, some of these reagents having no perceptible influence, and others, perhaps, a very lessening action on the colour sensitiveness ; but the only two that showed a more decided action than eosine were the hydrochlorate of diamidobenzole and nitrate of chrysaniline. These substances are very notably active in bringing out the green and the yellow prominently, so that in the photographs of the solar spectrum produced on plates treated with these, a second maximum of action is noticeable between the Fraunhofer's lines D and *b*. Near F, but a little towards G, is a locality of feeble action as in the case of eosine.

The nitrate of chrysaniline in conjunction with ammonia seems to exalt the sensitiveness of bromide of silver generally, and for this reason it may be well to add a trace of nitrate of chrysaniline to emulsions prepared with ammonia.

The difficulty of determining how far the action of those substances which render sensitive surfaces more suitable for the reproduction of coloured objects is a chemical action, or how far it is physical or optical (that is to say, depending on colour alone), is considerable, and one can only hope to arrive at a satisfactory solution of this problem by laborious and careful work. Indeed, it is by no means improbable that in certain cases there may be both optical and chemical action ; perhaps in cases when the most perfect isochromatism is obtained both these conduce to the result ; but it is easy to imagine instances in which the chemical and optical action of a dye stuff may be contrary, and the difference alone tells as effective result.

It is satisfactory to know that the most distinguished photographic investigators are now labouring in their endeavours to throw light on the problem of properly reproducing coloured objects in the monochrome of the photograph, and one may expect that before long very much light will be cast upon the matter.

Surely it would be by no means an ill use of a portion of the funds of the Royal Academy of Arts to promote a thorough investigation of the conditions under which paintings and analogous subjects can be best photographed ; and art in this country would certainly be much popularised if a really good photograph of every important picture in the national collections could be purchased at a small advance on the actual cost of production.

DEATH OF MR. C. JABEZ HUGHES.

Another of those names which have long been familiar to every photographer is now added to the long list of those who have gone ; Jabez Hughes having died on Monday, the 11th instant, at three o'clock in the morning. Mr. Hughes had been seriously ailing since the beginning of the year, and about a month ago he went to Harrogate for the benefit of his health ; but he returned home a fortnight since, being so weak that he had to be carried from the train. After this he kept his bed until the time of his death.

The immediate cause of his death was weak action of the heart, but both bronchitis and dropsy had served to bring him down. Mr. Hughes was between sixty and seventy years of age, and he commenced his photographic career about forty years ago, when he assisted Mr. J. E. Mayall at his studio in the Strand, near Lowther Arcade. Subsequently to this, he established himself as a photographer in Glasgow, and afterwards he returend to London, and established himself in the Strand.

In 1859 he removed to Oxford Street, and three years afterwards he took Lacey's Studio in Ryde, Isle-of-Wight, and Mr. Werge succeeded to the London business. At Ryde he soon rebuilt the old premises, and the fact of the Queen very frequently commissioning him to do photographic work for her served to make his establishment much frequented. During the last few years, almost the whole of the work turned out from the Ryde Studio was in carbon, a circumstance which adds much to the value of the work done.

Mr. Hughes was a very regular attendant at the meetings of the Photographic Societies, and he identified himself very actively with the work of the Photographic Society of Great Britain, he being a member of the council. He took the chair at the first meeting of the Photographic Club ; and he also presided at the last meeting which was held in the old quarters at Ashley's Hotel.

During the past quarter of a century Mr. Hughes kept up a constant succession of papers which he communicated to the Photographic News and to the societies; and it is interesting to note that in a paper which appeared in our volume for 1860 he referred in dicided terms to the possible advantages to be realised by using chloride of silver in conjunction with iodide when a latent image is to developed.

The funeral took place yesterday at Abney Park Cemetery, many faces well known in the Photographic world being recognizable among those present.

Practical Papers for Beginners.

No. 5.—MORE ABOUT EXPOSURE.

Making and Graduating Stops according to the Standard of the Photographic Society.

We may now suppose that the beginner has gained some notion as to exposure, but up to the present he has worked exclusively with tolerably small stops; and the next step is to consider how far exposure is to be modified when larger stops are used, and the light is unusually bright. Of course a change either in the direction of brighter light or of a larger stop means a possibility of giving a shorter exposure, and under favourable circumstances it will become easy to work so quickly as to obtain good representations of moving objects—the so-called instantaneous photographs. When the atmosphere is clear, and a few light fleecy clouds are visible here and there, is a good time for a first attempt at instantaneous work, and it may now and again be possible to work with the small stop previously employed, but generally a larger stop will be essential. Now the amount of light admitted through the lens by various stops is proportioual to the squares of the diameters of the stops, and the exposures are inversely as these numbers. If, for example, we have a series of stops having apertures one-eighth of an inch, a quarter of an inch, half an inch, and one inch respectively, the proportion of light admitted by them will be as follows, and the relative exposures required are shown in the last column, the amount of light passed by the one-eighth stop being taken as unity: —

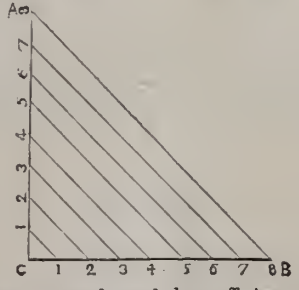
Diameter of opening of stop in eighths of an inch.	Relative amount of light passed by each stop.	Relative time of exposure require
1	1	1
2	4	$\frac{1}{4}$-th
4	16	$\frac{1}{16}$th
8	64	$\frac{1}{64}$th

The numbers in the second column are merely the squares of those in the first column, the squares being obtained by multiplying each number by itself; and a glance at the above brief table will show how the required exposure shortens very rapidly with the increasing diameter of the stop.

The Photographic Society of Great Britain has recommended that all stops should be marked according to the relative exposure required when they are used, a very excellent system, and probably before long opticians will adopt the plan of so making the stops. As a standard, the Photographic Society adopts for unity the stop having a diameter equal to one-fourth the focal length of the lens, this being the largest stop which is likely to be used, unless on quite exceptional occasions, and this is marked No. 1. Now it must be understood that all lenses are assumed to act with approximately the same rapidity when stopped down to the same fraction of their focal length, and although this is not absolutely true, it is sufficiently near the truth for most practical purposes, so that with the standard No. 1 stop (having a diameter equal to one-fourth the focus of the lens), the exposure will be approximately equal, whatever lens is employed. Stop No. 64, according to the standard of the Photographic Society, will have a diameter equal to one-thirtieth second of the focus of the lens, and will require an exposure 64 times as long as would be given with No. 1 stop. It is quite obvious that there are considerable advantages in numbering all stops according to a uniform system, as this plan makes the experience gained with one lens available with other lenses, and tends much to diminish the difficulty of becoming proficient in making correct exposures; but it is quite unnecessary to be provided with a stop corresponding to every number in the imaginary series, as the accuracy with which photographic exposures can ordinarily be made is not sufficient for there to be any need for two stops so near together as, let us say, 64 and 60. We will therefore assume that starting with No. 1 the following series is to be constructed: 1, 2, 4, 8, 16, 32, 64, 128, and 256; these being abundantly sufficient for all ordinary work.

We will suppose that the beginner wishes to construct standard stops for his lenses, and that he is provided with some thin black card, thin sheet ebonite, or metal plate for making them, and, moreover, that he has the means of cutting out holes of any required size. Ferrotype plate, by-the-bye, is an excellent material; but the newly-cut edges of the aperture must be blackened.

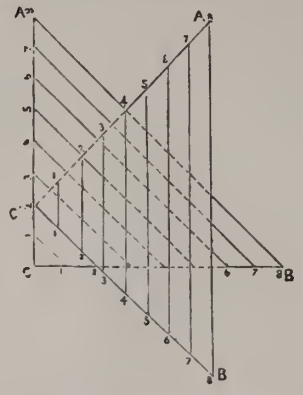
First determine the focus of the lens, this being done with sufficient accuracy by focussing some distant object, and then measuring the distance from the ground surface to the centre of the lens if a single one, or to the plane of the diaphragm if the lens is a doublet, one-fourth of this is the diameter of No. 1 stop; but it may be found that so large a stop cannot be used, and the next step is to determine the size of No. 2, or the stop requiring double the exposure of No. 1; and, again, from this, the size of No. 4 stop, or that requiring double the exposure of No. 2, and so on. The diameter of each member of the series recommended above will be to the preceding one as the square root of 2 (1·41) is to 1; and by taking advantage of the Pythagorean problem in Euclid's "Geometry," where it is demonstrated that the hypothenuse of a right-angled triangle is to either remaining side as the square root of 2 is to 1, it is easy to find a simple graphic method of setting out the size of the stops. This excellent method was recommended by Mr. Wilmer in our volume for 1881.



Take a piece of card, and lay off two lines at right angles to each other, and from the point of intersection, C, mark off equal divisions on the lines C A and C B, number the divisions horizontally and vertically, making the zero of the scale at C as shown, and join the corresponding points so obtained by diagonal lines, as indicated in the diagram. No. 1 stop ($\frac{1}{4}$) having been chosen to start with, is measured on the diagonal portion of the scale, let us suppose from 4 to 4; the distance from 4 to zero (C) will then be the diameter of the next stop, or No. 2. In the same way the diameter of No. 2 is set off on the diagonal scale (let us suppose from 3 to 3), and the distance from the scale point indicated, to zero, is the diameter of the next stop, No. 4 (or that involving double the exposure of that required with No. 2).

The diagonal lines are not absolutely essential, neither is it a strict necessity to have the figures on those sides of the triangle which are at right angles with each other; but the lines and figures are convenient, as enabling one

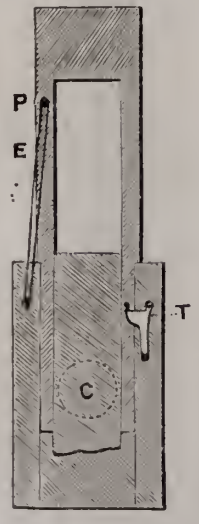
to make sure, that when setting out, the diameter of a stop on the diagonal, the distance from C is the same on the horizontal side of the triangle and on the vertical side. Mr. Wilmer recommends it as convenient to use two identical scales as in the next figure.



The diameter of the largest stop having been measured off on the diagonal of one scale, this first scale is so placed that the diameter of the next smaller stop, as indicated on one of those sides forming the right angle, can be measured off directly on the diagonal of the other scale; so that the reading of the third stop of the series is obtained at once.

Owing to the mechanical arrangement of many lenses, especially those with rotating diaphragm plates, it is not practicable for one who is not a skilled mechanic to replace them by others, and in such a case the best way is to set out the diameter of such a series as we have alluded to (1, 2, 4, 8, 16, 32, 64, 128, 256), and either to note how nearly the existing stops correspond to them, or to reamer out the apertures so as to make them to correspond.

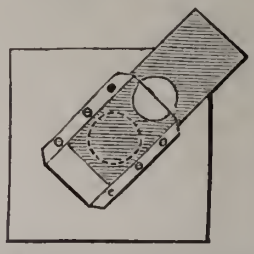
Unless the beginner has made himself very proficient in the use of the cap or of the Vogel sleeve (p. 435), he will do well to provide himself with some sort of a quick or so-called "instantaneous" shutter before taking the camera and a supply of dry plates out on an expedition away from home; and if he does take out an instantaneous shutter, it is very questionable whether he can do better than to take out the simple drop shutter, with the addition of a rubber band to somewhat quicken the exposure in case of need. The form represented below can be



fitted over the mount of the lens, and it is neither complex nor expensive. Of this form Captain Abney says:—

"The form, as will be seen, is a drop shutter, the aperture of which can be shortened by a sliding piece of ebonite. The opening for fixing on the lens is shown by the dotted circle, C. The total opening that can be given to the drop is six inches. At one side is a pin to which is secured a loop of elastic, E, which, when the shutter is ready for action, can be caught up by a pin, P. When the trigger, T, is withdrawn, the elastic causes the aperture to pass rapidly over the circle, C. By adopting this plan the full aperture of the lens is used during nearly the whole time of exposure, hence there is more light than when the length of opening is shorter, and where it drops by its own weight. This shutter can, however, be used to drop by its own weight by making the length of opening only four inches; it then begins to fall two inches above C, and the total length of exposure is then the same as if the drop commenced just above the opening of the lens with an aperture of two inches. By this plan, though the time of exposure is the same as in the last case, the total light admitted is increased by at least one-half, which is an important point."

When it is desired to make the action of a drop shutter slower, it can be turned round on the mouth of the lens so that it slides down obliquely, and in this way an exposure of a second or more may be given.



Of the methods which have been recommended for rapidly estimating the intensity of the light out of doors, we can recommend none to the beginner, but suggest he should trust to experience and observation: and it must not be forgotten that the subject has much to do with the exposure required. Water or sea scenes require, for example, much less exposure than deep-tinted foliage.

The success of the amateur photographer out in the field will depend much on his artistic perceptions, and it is not possible to give such directions as shall infuse the power of artistic perception into the would-be photographer; but we may mention that it is generally desirable to avoid having any prominent object very near to the camera, and the camera should not, as a rule, be so placed that the sun shines directly on either its front or back. During exposure the lens ought to be shaded when possible (an umbrella answering admirably), and when short (instantaneous) exposures are attempted, there should be no rapidly moving objects passing *across* the field of view in the immediate foreground. The effect of haze or smoke is generally exaggerated by the camera, a circumstance which should be remembered, as a little haze in the distance often improves a picture much, while more damages it. In gusty weather one must often wait for a lull before making the exposure, and it is often an excellent plan to hang a bag or net from the tripod top, the bag being quite close to the ground and filled with stones. Dark slides must be exposed to intense light as little as possible, as the thin wood used in making them is by no means absolutely impervious to light.

Careful notes should be taken of the condition under which each plate is exposed, and the beginner may be expected to return with his slides loaded with plates, some over-exposed, others under-exposed, and, we will hope, many which have had a correct exposure.

Notes on developing such a mixed collection must stand over until next week.

TABLE SHOWING LONGEST SIDE OF PICTURE INCLUDED BY LENSES OF DIFFERENT FOCI AT A GIVEN ANGLE.

BY W. FREDERICK MAYES, ASSOC. M. INST. C.E.

	Inches.															
Focus.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Angle of View.	Base Line of Picture in inches.															Diff.
10°	·35	·52	·70	·87	1·05	1·22	1·40	1·57	1·74	1·92	2·09	2·27	2·44	2·62	2·79	·175
15	·53	·79	1·05	1·31	1·57	1·84	2·10	2·37	2·63	2·90	3·16	3·42	3·69	3·95	4·21	·263
20	·70	1·06	1·41	1·76	2·12	2·47	2·82	3·17	3·53	3·88	4·23	4·58	4·94	5·29	5·64	·350
25	·89	1·33	1·77	2·21	2·65	3·10	3·55	3·99	4·43	4·88	5·33	5·77	6·21	6·65	7·09	·443
30	1·07	1·61	2·14	2·68	3·22	3·76	4·29	4·83	5·37	5·90	6·43	6·96	7·50	8·03	8·57	·536
35	1·26	1·89	2·52	3·15	3·78	4·41	5·04	5·67	6·30	6·93	7·56	8 19	8·82	9·46	10·09	·630
40	1·47	2·19	2·91	3·64	4·37	5·10	5 82	6·55	7·28	8·01	8·73	9·46	10·19	10·92	11·65	·728
45	1·66	2·49	3·31	4·14	4·97	5·80	6·63	7·46	8·29	9·12	9·95	10·78	11·61	12·44	13·25	·825
50	1·86	2·79	3·73	4·66	5·59	6·52	7·45	8·38	9·31	10·24	11·17	12·11	13·04	13·97	14·92	·932
55	2·08	3·12	4·17	5·21	6·25	7·29	8·34	9 38	10·42	11·46	12·50	13·54	14·58	15·62	16·67	1·040
60	2·31	3·46	4·62	5·77	6·93	8·08	9·24	10·39	11·55	12·69	13·84	15·00	16·16	17·31	18·47	1·154
65	2·55	3·82	5·10	6·37	7·64	8·92	10·19	11·46	12·74	14·01	15·29	16·56	17·84	19·11	20·38	1·274
70	2·80	4·20	5·60	7·00	8·40	9·80	11·20	12·60	14·00	15·40	16·80	18·20	19·60	21·00	22·40	1·40
75	3·07	4·60	6·14	7·67	9·21	10·74	12·28	13·81	15·35	16·88	18·41	19·95	21·48	23·01	24·55	1·534
80	3·35	5·03	6·71	8·39	10·07	11·75	13·42	15·10	16·78	18·46	20·13	21·81	23·49	25·17	26·85	1·678
85	3·66	5·49	7·33	9·16	10·99	12·83	14·66	16·49	18·32	20·15	21·98	23·82	25·65	27·48	29·32	1·832
90	4·—	6·—	8·—	10·—	12·—	14·—	16·—	18·—	20·—	22·—	24·—	26·—	28·—	30·—	32·—	2·—
95	4·36	6·54	8·73	10·91	13·09	15·27	17·46	19·64	21·82	24·01	26·19	28·37	30·56	32·74	34·92	2·182
100	4·77	7·15	9·53	11·91	14·29	16·68	19·06	21·44	23·82	26·21	28·59	30·97	33·36	35·74	38·13	2·382

Formula . . tan ½ angle × focus × 2 = base line.

For lenses of foci containing fractional numbers, multiply figures in column headed Diff., and on same line as the angle of view, by the numerator of the fraction, and divide by denominator, adding the result to that previously ascertained for the whole number.

Example.—Required base line of picture enclosed by an angle of 65°, focus of lens being 8⅔″.

Opposite 65° and under 8, will be found base line for 8″ = ... 10·19

On the same line will be found Diff.=1·274 which ×2 ÷ 3= ... ... ·51 nearly.

Size of picture ... ... 10·70 ins.

Note.—The angle obtained on a plate twice the length of the focus is... .. .. 90°

Ditto	ditto	1¾	ditto	82
Ditto	ditto	1½ times	ditto	74
Ditto	ditto	1¼ „	ditto	64
Ditto	ditto	same as	ditto	53
Ditto	ditto	⅔	ditto	37
tto	ditto	½	ditto	28
Ditto	ditto	⅓	ditto	19

When the focus of a lens is doubled, the angle remaining the same, the size of the resulting picture is doubled likewise.

The base line and equivalent focus being known, the angle of view is equal to

$$2\left(\tan \frac{\frac{1}{2}\text{ base line}}{\text{equi focus}}\right)$$

Example.—Wanted, the angle of view subtended by a base line of 10 ins., focus of lens being 7 ins. Half base line divided by 7 = ·71428, &c. On referring to a table of natural sines and tangents, we find in the column of tangents the number ·71417, &c., the nearest to the above; and opposite to this the number of minutes (32), the degrees (35) being given at the head of the page. The result—

$$35°\cdot32'\times2=71°$$

is the angle required.

The angle can be ascertained by diagram as follows:—Draw a line of exactly half the length of the base line, erect at one extremity a perpendicular equal in length to the focus, join the extremities of the two lines by a third. The angle included between the diagonal and the perpendicular, multiplied by 2, is the angle of view.

For distance of camera from nearest object in foreground to include a certain view, as longest side of plate is to equivalent focus of lens, so is base line of view to distance of camera.

Example.—The focus of a lens is 10½ ins., effective size of plate 7 ins. Two objects in the foreground, the

boundaries of the views are 13 yards apart. At what distance should the camera be placed in order to include the view within the given 7 ins. ?

f=10·50ins. =focus.
p=7·00ins.=plate. $p : f :: b$: dist.
b=468·60=boundary of view. $\frac{468 \times 10{\cdot}50}{7}$=702 ins. or (say) 19 yards.

THE ETCHING PROCESS FOR RELIEF AND *INTAGLIO* PRINTING, DECORATION OF CHINA, ETC.

BY GEO. G. ROCKWOOD.*

On a recent occasion I brought to the notice of the Photographic Section of the American Institute a process which I had introduced and practised for the decoration of china or stone-ware by the aid of photography. The process as then outlined was as follows, and is taken from the report of the meeting :—

"What is known as printed ware, formerly in common use, and now being reintroduced, was decorated by a process of 'offset,' so to speak, from impressions made from engraved copper plates. The design for a dinner set was first drawn by an artist, and then engraved in *intaglio* on large copper plates, costing from six to a hundred guineas, depending, of course, upon the elaborateness of the design. When these copper plates were engraved, they were filled with a mineral pigment ink of any desired colour for the design. Soft paper made for the purpose was pressed upon the plate, and the ink printed on the paper in the same manner as in ordinary copper-plate printing. These sheets were trimmed and cut into the desired forms, and then applied to the ware while in the bisque or unglazed condition. The paper was then removed, leaving the picture or design upon the dish, after which the glaze was applied. It occurred to Mr. Rockwood that by reversing the action of photo-engraving or etching process, these expensive plates could be produced by our art. Securing a 'line subject,' he first made a negative, and from it a positive on glass. He then coated a smooth sheet of zinc with bichromated albumen, and exposed the plate under the positive. It was of course apparent that, when inked up, the parts unaffected by the light would be washed off by the water, and that the lines of the image would be bare instead of being covered as when printed with a negative. When etched, the lines only were attacked, and they formed an image in intaglio, or below the surface, instead of being in relief. This plate, upon being filled with the pigmented ink, served the purpose in every way as well as the engraved plates. As zinc would not retain heat—a necessary condition in a stage of the printing—he tried the same experiment with a copper plate, and secured at a trifling expense very delicate designs which would have cost a large sum to engrave. He next exhibited a tea plate with a humorous design on it, and also the zinc plate from which the picture was printed, remarking that any gentleman desirous of experimenting in this line would be furnished further information, if desired, as he had no idea of pateuting the process, if patentable."

In reponse to the invitation extended I received a large number of letters, the answers to which are herein given :

To cover the ground touched upon in this correspondence, it is necessary to explain the whole process of photo-etching on zinc or copper. I shall at first attempt to make plain the process for relief printing for press work, and then the intaglio or sunken lines for artistic decoration.

The glass should be treated with nitric acid (and potash when using old glass) in the usual manner, but not albumenized, as the film or negative in one stage of the process has to be stripped from the glass in order to obtain a reverse image. When the glass is perfectly clean and dry, a solution of the finest talc or French chalk should be flowed upon the plate.

Talc solution is made of one ounce of talc and eight ounces of alcohol. This should be gently rubbed off with canton flannel ; enough will remain on to cause the film to leave the glass after the negative is made.

Preliminary rubber coating.—When prepared with talc, cover the edge of the glass to the width of a quarter of an inch with rubber solution made as follows :—

Benzine	8 ounces
Rubber cement	½ ounce

The cement may be obtained of the rubber companies at a cost of 25 cents a can. It readily dissolves in the benzine, and is best applied with a brush.

The glass being in order, we next need a collodion which will give vigorous results. This is made as follow :—

Collodion for Black and White Negatives.

Ether	1 ounce
Alcohol	1 „
Iodide of ammonia	5 grains
Bromide cadmium	1 grain
Cotton, 7 grains to the ounce	

The silver bath must be 45 to 50 grains to the ounce of water, and strongly acid to test-paper in five seconds—nitric acid, C. P.

The Developer.

Protosulphate of iron	15 grains
Water	1 ounce
Acetic acid, 1½ ounces to 20 of solution	

The exposure should be only long enough to bring out the fine lines—a rule always to be regarded—as they are the most difficult to preserve.

The development should be stopped the instant the details are well up, and the plate cleared with a weak solution of cyanide of potassium, after which it must be thoroughly washed.

The washing of the negative at this and at all subsequent stages of the intensification is very important. There should not be a trace of the fixing solution remaining in the film when the next solution is applied.

The bleaching is accomplished by a solutiou of—

Sulphate of copper	30 grains
Bromide of potassium	30 „
Water	1 ounce

It can be used as a dipping bath, but is generally poured on and off till the film becomes opalescent. Wash again, and allow the water to cover the plate well. A "rose" or shower spout is best. Constantly move the plate till thoroughly washed ; then,

Blacken by pouring over the entire plate a solution of :—

Pure nitrate of silver (not bath) ...	30 grains
Water	1 ounce

Ordinarily the negative is sufficiently intense ; if not, repeat the bleaching and blacking (constantly looking after the washing). If thin, the plate is probably under-exposed ; if thick, with tendency to closed lines, the plate has been over-timed. If the lines are perfectly clear, and more density is required in the whites, make a solution of hydrosulphuret of ammonia 1 ounce, and water 1 ounce, and flow over the plate. Wash again thoroughly. When dry flow with the rubber solution, and let that also dry.

Stripping plates. When dry, flow with collodion made as follows :—

Alcohol	10 ounces
Ether	10 „
Cotton (10 grains to ounce) ...	180 grains
Castor oil (5 drops to ounce)	102 drops

Let dry, which will take four or five hours if done spontaneously, which is the best. It can be hastened by heat. Then, with a sharp knife, cut around the edge of the plate inside of the india-rubber safety edge, and set in a tray of acidulated water. In a few moments the film will loosen. Gently take it by the corners and reverse it on another clean plate which has been placed in the water. When in place, carefully lift the plate out of water and squeegee it into perfect contact, removing all bubbles. When dry, which can be accelerated by heat, it is ready to print on the zinc for relief plates.

For intaglio plates the stripping can be omitted, and reverse positives can be made in the camera by working through the negative. The positives should be made black and white, in the same manner as the negatives. Negatives from which positives are to be made need not be as intense as when they are to be used for printing upon the zinc.

To continue the process for relief printing we use the reversed negative which has been described.

The zinc for etching purposes may vary in thickness with the subjects to be reproduced. Coarse or outline subjects require deeper etching and thicker plates ; fine, close subjects may, of course, be put upon thinner plates. The metal is now rolled by the manufacturer of the proper thickness and of any size that may be required. It is also sometimes obtained with such an excellent surface as to leave but little to be desired. In establishments where the process is worked commercially a planer

* Communicated to *Anthony's Bulletin.*

is necessary, and powerful presses for bringing large sheets to a perfect plane. The experimenter will, however, find but little difficulty in getting small sheets with small surface and proper plane. Slight imperfections and inequalities may be removed with Scotch stone. A specially good charcoal may be had, which gives the plate an excellent polish. The zinc being prepared, it receives a tooth and an admirable surface by a short preliminary etching in the acid bath.

The sensitive surface is obtained by bichromated albumen. Either fresh eggs may be used, or the dried albumen of commerce. We found the latter to work more uniformly in the various seasons. Where the latter is not at hand we found the former can be used in these proportions:—

Albumen (free from yolk)	4 ounces
Water	1 ounce
Bichromate of potash	30 to 40 grains

The dry albumen can be used as follows:—

Dry albumen	1 ounce
Water	6 ounces
Bichromate, as before	

Either solution should be carefully filtered through paper, and a few drops of ammonia added. When not in use, keep carefully corked and away from the light. It is best to prepare it frequently for use rather than retain the solution long on hand. Now secure some form of rotating disc upon which the zinc plate can be secured. We inverted a Yankee egg-beater, and upon the end adjusted a flat piece of wood in which were catches or buttons which held the zinc plate in its place and always horizontally. Carefully cover the zinc plate with the solution, drawing it to the corners with a piece of paper or a clean finger.

When completely covered, pour off into a different vessel to be filtered before use again. Now place the coated zinc plate upon the rotating table and begin slowly to revolve the plate; then increase the speed until the coating has by centrifugal force left but a thin even coating on the surface of the zinc. Remove the plate, and with a gentle heat (from 100° to 120°) dry the surface. Too much heat destroys the film. So soon as dry let the plate cool to ordinary temperature, when it is exposed under the negative. The time of exposure must be ascertained by experiment, a clear open line negative printing very quickly.

The printing press should be very strong, with four or five strong back strips which have powerful wood or metal hand-screws running down to the back-board of the printing-press, by which perfect contact can be assured. It is needless to say that the front glass of the printing press should be very thick and of plate glass. Three-quarters of an inch in thickness is about the right thing.

After the exposure the plate should be rolled with a very thin but even coating of lithographic ink softened and worked down in oil of lavender. The ink is best applied with a fine lithographic roller, though small plates may be covered with a "proof" dabber, such as is used by engravers for inking their blocks.

The development is quickly and easily accomplished in a pan of water—some prefer it slightly acid—and a soft tuft of cotton. By gently rubbing the surface, all of the zinc plate which has been protected from the action of light washes away, leaving the image in black lines upon a clear and bright surface. If the surface refuses to clear it would indicate over-printing; if the lines wash away it signifies that the exposure has been too short.

We now have an image on the zinc surface which is covered with a fatty ink, and which will resist in a measure the action of the acid. If the subject is pretty close, a brief etching may be given it in weak nitric acid.

The etching bath is made of nitric acid 1 ounce, water 6 to 8 ounces. The strength of the acid varies with the subject and the progress of the work. Weak acid is used at first in all cases. If the subject is close and fine, the etching solution should be kept weak, and the etching proceed slowly in order to keep the lines intact, and for the reason that such subjects do not require deep etching. In open subjects and coarse lines the work may progress more rapidly after the first etching. The lines would be quickly "cut under" if no other precaution was used to preserve them. So, after the first etching, the plate is washed off in clean water, and placed on a sheet of planed iron, under which is a series of Bunsen burners, and brought to a strong heat, and dried. It is now cooled to the temperature of 80° or 90° F., and placed in a tray containing finely-powdered resin or dragon's blood. This substance is gently brushed over the plate with soft, broad brushes. A small quantity adheres to the lines, when the plate is returned to the hot table, and brought to such a temperature as will melt the gum employed. This operation of cooling and brushing the resin over the plate is often repeated by careful workmen three or four times before exposing the plate to the action of the etching bath. When the lines have been thus covered, the plate is placed in the etching bath, and the latter kept in constant motion by rocking. The baths are usually suspended on pivots or arms, in order to receive this rocking motion. This second etching goes quite rapidly with an increase in the quantity of acid. The image already stands out in strong relief, and if a copy of a steel engraving or other close, well-covered design, the relief is sufficient. If not, and there are large patches of white with considerable open work, the heating and application of the protecting gum is repeated once or twice more. When the etching is complete, a little turpentine will remove the plate clean, and in order for printing, after blocking and routing. Before etching at all, the back and edges of the zinc plate should be painted with a good thick coat of asphaltum varnish. This obviously will prevent the etching fluid from dissolving the zinc. The same material (asphaltum) can be used to cover such portions of the plate as may be fully etched, and a necessity still exists for further etching in other parts of the plate.

We have thus gone through with the relief process. We will now briefly discuss the *intaglio* (or sunken line) plate, from which we get our "offsetts" for decorative purposes. Going back to the negative, we find that the film does not require to be stripped or reversed. After a good, strong black and white negative is secured, it is placed in a copying box, face outwards, and copied precisely as we would make a stereopticon slide or other transparency. This gives a reversed positive. The same care should be taken to preserve the background clear and the lines opaque, as already suggested while making the stripping negative for the relief process. The after stages are precisely the same up to the point of etching. It will be seen that while in the relief process we had an image of black lines on a polished metal surface, we now have the reverse, the lines being white, clean metal against a black ground.

In almost all cases of engraved or *intaglio* plates, a single etching, and that a very brief one, is quite sufficient. Some use for this purpose, especially with copper, the perchloride of iron dissolved in strong alcohol—one part by weight of the former to two parts by measure of the latter—or perchloride of iron 100 grams, alcohol 200 grams.

To make the distinction clear as between relief and *intaglio* an

example of the latter, used in the decoration of some china, is given above.

Etching Trays.—As metal pans will not do for etching purposes, wooden trays should be made of the proper size, and lined with—

Common brown resin	½ pound
Bees'-wax...	2 ounces

Melt these together in a tin pan; when quite fluid, run the solution rapidly where required. The wood should be perfectly dry. If lumps appear, apply a hot smoothing iron to level them.

NOTE.—Since preparing the above, I find in the photographic journals,* a very interesting and illustrated article by Mr. S. H. Horgan, entitled "Photography and the Newspapers," in which he briefly describes various processes, and by diagrams shows admirably the various steps towards their production.—G. G. R.

Notes.

The view of Constantine which we issue as a supplement this week gives a good general idea of the city, mounted, as it is, high on its rocky eminence; and next week we shall publish a very characteristic picture which Mr. Pritchard obtained in one of the by-streets of the Arab quarter.

Photography has of course often found its way into the Board-room ere this; but the other day, at the meeting of a well-known railway company, the chairman laid upon the table, for inspection of the shareholders present, several photographs of new locomotives and other improved rolling stock, with views of a bridge of more than usual importance which had been completed during the past half-year. The evidences of advancement thus furnished were accepted by the meeting with much satisfaction.

The burnished brass photograph frames now to be seen in the stationers' windows are the latest novelty, it may be presumed, in this particular direction. There is a suggestiveness of perpetuity about these frames which it would be well, perhaps, for all photographers to "try to live up to" in their work. A good portrait study—not necessarily a "brazen faced" subject—might then, in fact, in this new metallic surrounding, be considered to be a memorial literally in monumental brass.

A National Portrait Gallery for Scotland may soon be in existence: the offer of £20,000 recently made by an anonymous donor becoming void, unless some action is taken before the first of next month. Government proposes to give £5,000 towards a site.

A portrait gallery in the old sense of the expression means a collection of paintings; but may one not expect that some day a collection of photographs will be regarded as being far more valuable from an historical point of view than any collection of paintings can be?

At any rate, photographs should be secured in all cases where practicable, and added to the collection—certainly not silver prints, but rather carbon prints made to a uniform size, say 48 to 36 inches.

A burnt-in or enamel photograph of each portrait might be made, let us suppose on a tile five or six inches square, and these ceramic pictures should be stored in a fireproof vault.

Although fireproof in one sense, a photograph on porcelain cannot be expected to pass unscathed through an ordinary fire in a building, therefore a fireproof room would be necessary.

Crude and clumsy as is the recent endeavour of the authorities of the National Gallery to make some use of photography for the multiplication of the national art treasures, it at any rate shows that they have a vague idea of the importance of the matter, and it is to be hoped that they will soon realise the fact that the hideous structure of galvanised iron with which they have disfigured Trafalgar Square is altogether unsuited for the copying of paintings—although, perhaps, more or less adapted for making sixpenny ferrotype portraits. They may then be disposed to take capable advice on photographic matters, and adopt means for overcoming the exceptional difficulties which attend the reproduction of paintings by the camera. Certainly, when a good negative is secured of a picture, a ceramic photograph should be made and stored in a safe place.

M. Pedrono has it that some persons can in a certain sense recognise a colour in sound—that is to say, sounds produce a certain luminous effect on the optic nerve; but, to do this, the sounds must rise above a definite minimum of intensity. Among those to whom sounds appear to produce coloured impressions, he has found a uniformity of experience which leads him to regard the phenomenon as truly objective, rather than subjective.

The character or stamp of the sound determines the colour rather than the pitch or truly musical value, a tune executed on a saxophone or an harmonium recalling red, while the same music performed on a clarionet recalls blue. If there is even what Herbert Spencer calls a *soul of truth* in this matter, it is worthy of being thoroughly investigated.

Those who, hearing by chance of the invention of a new process known as Phytochromotypy, may have imagined it a rival to photography, will be relieved to hear that it is only a new way of producing impressions of leaves of plants. It also produces an impression, on the minds of those who read the details of the process, that the game is hardly worth the candle.

Amongst the numerous methods adopted in the States to push the candidates for the Presidency, Mr. Blaine's friends have hit upon the notion of distributing packs of playing cards, on the back of each of which is a photograph of the republican nominee. And now it seems Governor Cleveland's backers are taking steps to follow suit in the new card game—a game, by the way, which the playing card manufacturers hope both parties will continue to play at.

"Is the celebration or inauguration of the Daguerre Monument at Corneilles to be an annual ceremony?" may be asked. We recorded it last autumn, and it took place

* "PHOTOGRAPHIC NEWS," 1881, p. 427.

again on the 27th ultimo. There was some speech making, M. Letellier taking a prominent part; but justice was hardly done to Niepce, who was unquestionably before Daguerre in the production of a permanent camera photograph.

M. Glaise, the treasurer of the fund, said:—"On peut, Messieurs, associer au nom Daguerre ceux de Nicephore Niepce et de Poitevin, au monument duquel notre Comité s'est fait un devoir et un honneur de souscrire; mais si ces deux grands noms ont aussi leur part de gloire, il est incontestable, aujourd'hui, que Daguerre, l'enfant de votre pays, est celui qui a obtenu le premier résultat cherché: *Fixer, d'une façon durable, l'image vue dans le chambre noire.*

No one seems to have had a word more than this to say for the first inventor of photography, Nicephore Niepce, and Talbot was not even mentioned.

A new phase is gradually creeping into photographic portraiture. We refer to the taking of portraits at the sitter's own home, thus saving the trouble of a visit to the studio. A well-known Parisian photographer makes this branch a speciality, and no doubt finds it pay, since only wealthy people can afford the luxury, the fee charged being necessarily high. The series of photographs in photogravure of "Statesmen at Home," now being prepared by Messrs. Sampson Low and Co., as a pendant to the successful series "Artists at Home," will give a spurt to this kind of thing; and it is quite possible that before long to send for the photographer when one has nothing to do will be an accepted amusement in fashionable circles. Naturally, to be successful in these "At Home" portraits requires special study; but any photographer who identifies himself with this particular branch will not find his time thrown away.

Those who are behind the scenes with regard to that wonderfully developed trade in Christmas cards, know that the wholesale manufacturers are now busily engaged in producing new patterns and notions for the Christmas of 1885. Those for next Christmas have been manufactured and were delivered to wholesale houses months ago. We only allude to these facts in this column to mention that among the novelties for the coming Yuletide, photographic cards will be unusually numerous. The use of views of well-known "Beauty Spots" in the various parts of our islands as Christmas cards will be considerably extended.

One photographic series consists of a number of studies of very pretty and charmingly dressed children, cabinet size; and another contains a number of densely-grouped scenes from well-known novels, such as "Bleak House," "Orley Farm," and "Westward Ho."

It is usual to photograph a prisoner on the completion of his sentence as well as at its commencement, and the "Claimant," whose release will take place in October—the 14th is the day which will restore him to his admirers—has made application to the Directors of Convict Prisons that he may not be photographed before he leaves Portsmouth, but that the operation may be deferred until he arrives at Pentonville, whither he will be transferred just before his discharge.

He gives as a reason for his application, his fear lest if he be taken at Portsmouth the likeness may get in the hands of a local photographer and copies be disposed of, as he asserts once happened at Milbank. If this was indeed the case, it is certain that an irregularity has taken place, and that the "Claimant" has a right to protest against its repetition. Prison photographs are taken for police purposes only, and should on no account be turned to outside use. Mr. "Castro" has special reason to guard against such a breach of prison discipline as he fears, for on his reappearance amongst us he will doubtless find in the sale of his photographs a profitable source of income for a time. Those who possess a carte of him in the days of his corpulent prosperity, ere cross-examination and protracted seclusion played such havoc with his fleshly form, will be anxious to compare that picture with one of the reduced and attenuated "Roger" who will leave Pentonville in two months time; and it would be indeed hard if he should be prevented from reaping the results of the "fining down" of which he has been the subject.

In the course of two or three hours' stroll through the streets of Brussels last week, with an especial eye to the photographs in the shop-windows, we were struck with the almost total absence of photographs of the places of interest. The light is so delightfully pure in Brussels that one would have thought the impulse to seek out and secure instantaneous views of the street scenes would have been irresistible. But no one seems to have done anything of the kind, and the traveller who wishes to secure mementoes of little Paris has to put up with very indifferent specimens.

The latest fashion at French watering places is to be photographed in your bathing dress. If the fashion comes over here, it will give a spurt to the business of the itinerant seaside photographer. It is to be hoped, however, before this comes about that the hideous bathing dress of Margate and elsewhere will be a thing of the past.

It would be interesting to know the exact terms which the much-photographed Mrs. Langtry now makes with photographers. Before proceeding to San Francisco, she sat to an Eastern photographer, binding herself under a heavy penalty not to be taken in San Francisco; and the natural inference is that she was paid by the Eastern photographer, for without some valuable consideration no one would enter into so one-sided a bargain. Mrs. Langtry, while in San Francisco, kept strictly to her agreement, but her portrait nevertheless was taken; for an enterprising photographer sent an assistant to the Yosemite Valley, and secured two instantaneous portraits of the Jersey Lily—one as she was getting into the stage coach, and another as she sat on the hotel verandah.

There is an attempt being made in France to grapple with

the artistic copyright question. So far as photographs are concerned, the initial difficulty has not yet been overcome—that is to say, whether a photograph is, or is not, a work of art; some of the courts of law having decided in the affirmative, and others the reverse. Be this as it may, it is now proposed to protect the photographer, but in a less degree than the painter. Thus there is to be no copyright in photographs for more than five years, none will be protected unless copies have previously been deposited in some public office, and finally, in any case, only such photographs as "show artistic worth" will be entitled to the benefits of the Act. The report of the committee which has investigated the subject fails in one important particular—it does not say how the question of "artistic worth" is to be settled.

The Bill prepared and brought in (not for the first time) by Messrs. Hastings, Hanbury-Tracy, Agnew, Gregory, and Sir Gabriel Goldney, to amend and consolidate the Law of Copyright in works of Fine Art and in Photographs, has, as already stated, been again involved in the usual autumnal "massacre of the innocents." The clauses more specially interesting to photographers were 9, 10, and 17, and their purport has been already stated in these columns.

Mr. Hastings, M.P., fully intends to re-introduce his measure next spring, and he will probably again have the names of the same colleagues on its back; but meanwhile the law as to the copyright of a photograph remains in that curiously unsatisfactory condition that the Master of the Rolls described when he said that, were the existing law carried out to its logical end, the actual copyright of a view taken by natural light would be vested in the very sun itself! What a *cause célèbre* we might have with the Solar Luminary as the plaintiff, and with Phœbus Apollo, say, joined to the suit as *amicus curiæ*.

Now that the tourist season is upon us again, it may be well to remind continental travellers that foreign Customs officials have occasionally prejudiced views, not only as to photographic chemicals and other accessories, in which they of late have persisted in scenting dynamite, but actually resent the undeclared presence in one's portmanteau or hand-bag of anything like large collections of finished photographic views. The French *douane* generally, as we have reason to know, is especially strict as to the latter, and unless the officer in charge at Vintigmilia, on the Riviera frontier, has been lately changed, particularly absurd notions on the subject are current here.

We were returning from a visit to Italy some few years since, and had bought at Naples, Rome, Florence, Genoa, and elswhere, a large selection of the inevitable photographic views of the localities. Well, at Vintigmilia, not thinking that so harmless an indulgence in normal tourist extravagance could in any way bring us into the clutches of the *douane*, we failed to declare the said photographs, the result being that a few minutes later we were being marched off by a gendarme—we have a notion that he drew his sword, the more to overawe us—into the offended presence of the *chef de douane*. Had we been caught red-handed in the act of trying to pass Orsini bombs or tobacco in bulk, that official could not have assumed a more seriously tragic air. The tone in which he dwelt on the enormity of our offence, and enlarged on the *grande amende* to which we had rendered ourselves liable, we shall never, never forget. It seemed to foreshadow detention in some dark and deep local dungeon at the very least; and when ultimately our explanations and apologies were accepted, and we found that we were to be allowed to proceed to Mentone—photographs and all—the reaction was so great that, in our state of relieved tension, we positively treated the gendarme—his sword was sheathed now, however—at the local *buffet*. Moral: Take care to "declare" any photographic views you may carry from one Continental country to another.

Patent Intelligence.

Applications for Letters Patent.

10,950. ALEXANDER HENRY REED, 90, Cannon Street, London, Engineer, for "Certain improvements in photographic cameras." A communication to him from abroad by Calvin Rae Smith, New York, United States, Artist.—Dated 5th August, 1884. (*Complete Specification.*)

10,970. FREDREIC SAFE, Photographer, 28, Grove Road, Holloway, N., London, for "Enamelling (as termed in photography) surface-coloured photographs, whether the same are coloured or painted in water or oil colours."—Dated 6th August, 1884.

Specification published during the week.

3392. T. CARTILE & PARK. "Manufacture of bichromate of soda." *Provisional Specification.*

Our said invention has for its object to obtain bichromate of soda in an anhydrous crystalline form. In carrying out our said invention, we adopt any well-known or suitable process, so far as to obtain the bichromate of soda in the form of a concentrated solution, or in the form of hydrated crystals. We take the concentrated solution, or the solution obtained by heating the hydrated crystals until the salt becomes dissolved in its water of crystallization, and subject the same to heat in any suitable vessel fitted with mechanical agitating or stirring apparatus. We prefer to apply the heat by means of steam admitted to a jacket encasing or surrounding the vessel; but the heat may be applied in any other convenient way, care being taken to have it uniform at all parts of the vessel, and to keep temperature below the fusing point of anhydrous bichromate of soda. Whilst the heat is being applied constant agitation is kept up; and as the water evaporates small anhydrous crystals are formed, the entire mass being ultimately converted into an anhydrous crystalline powder. The final specification gives details as to the evaporating of a solution of bichromate of soda to dryness by the aid of heat or stirring.

7678. A. MCDONALD & T. WILLIAMSON.—"Washing unmounted photographs, &c."—*Provisional Specification.*

A rocking washing trough, the following points being claimed:—

1st. A divided trough with a syphon at, or near, each end in combination with a source of water supply, and a pivoted washing trough in an outer trough or reservoir, substantially as and for the purposes described.

2nd. In a photograph washing apparatus, the pivoted trough suspended in water receptacle having perforated bottom and automatic means for periodically tilting it, whereby the water is caused to rise through the perforations and gently stir up the photographs.

3rd. In a photograph washing apparatus, the application of the constant water supply to first actuate the stirring or shaking mechanism, and then to fall into the washing apparatus and be used for washing, substantially as described.

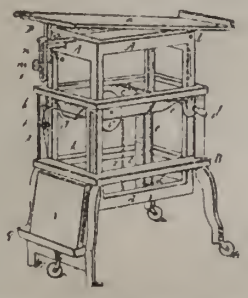
Patents Granted in America.

302,836. Jean Francois Geesbergen, and Alfred Geruzet, Brussels, Belgium. "Photographer's electric retouching device." Filed Oct. 24, 1883. (No model.) Patented in Belgium, July 28, 1883, No. 62,164; in France, Sept. 19, 1883, No. 145,263; in England, Sept. 24, 1883, No. 4,557; in Germany, Oct. 9, 1883, No. 27,091; in Italy, Oct. 24, 1883, 491/16,006; and in Austria-Hungary, Dec. 26, 1883, No. 37,177, and No. 53,504.

A description of the apparatus will be found in our vol. for 1833, p. 645.

302,639. James H. Smith, Quincy, Ill. "Photographic camera-stand." Filed Aug. 20, 1883. (No model.)

Claim.—1. In a photographic camera-stand, the combination, with a main frame, B, and an inner vertically-moving frame, A, of the crank *d*, shaft *c*, cross-frame *g*, band *e*, and roller *d'*, and suitable means for locking together the frames A and B.



2. In a camera-stand, the combination, with the frames A B, of the posts K K on frame B, forming with the frame A the openings *i i*, the rod J, and the wheels or cams *h h*, for the purposes herein described.

3. In a camera-stand, the combination, with the frames A B, of the crank *d*, shaft *c*, belt *e*, and roller *d'*, and the locking device consisting of the posts K K, rod J, and wheels or cams *h h*, all arranged substantially as described.

4. In a camera-stand, a locking device consisting of the knob or wheel *m*, having the hollow threaded shank *m'*, screw-head *u*, block *v*, and screw *t*, in combination with the slotted pendant *n*, and the support P attached to the table, as described.

5. In combination with the frame of a camera-stand, the bolster K', journaled in said stand, the platform *a*, hinged support P, block *a'*, slotted pendant *n*, knob *m*, threaded hollow shank *m'*, washer *s*, screw *t*, guide-block *v*, screw-head *u*, perforated flange *o*, and pivot *p*, arranged substantially as described.

6. The herein-described photographic camera-stand, formed of a main frame B, and inner frame A, and having suitable rollers, a tray *q*, crank *d*, shaft *c*, cross-frame *g*, belt *e*, roller *d'*, posts K K, rod J, wheels *h h*, spring *b*, grooved wheel *b'*, cord *z*, the bolster K, table *a*, hinged support P, block *a'*, slotted pendant *n*, knob *m*, hollow threaded shank *m'*, washer *s*, screw *t*, guide-block *v*, screw-head *u*, flange *o*, and pivot *p*, all arranged substantially as herein set forth.

PHOTO-ASTRONOMY AT THE RIFFEL.

BY C. RAY WOODS.

No. II.

Wind, hail, rain, mist, and snow. Weather is as changable here as in England. One day the wind blows with such force that I almost expect to see my little observatory loosed from its moorings and carried down to Zermatt; the next day the sun blazes down upon it with almost tropical energy; then comes a day of rain and mist; then a day of thunderstorms and hail; next a fine day with a mackerel sky, tantalizing one more than downright bad weather. And so it goes on. Pick out all the terms used in meteorology, they are sure to be applicable some time or other, with possibly a few exceptions such as "tornado," &c. That is a refreshing word, "tornado." We have not had a tornado yet, and so I will not grumble any more.

And yet had I come here for pictorial work I think I should have been very well satisfied. Meteorological changes would then have been welcome, conferring fresh beauties on the scenery. But when one is condemned to remain at one spot, everything that interferes with the purpose one has before him is almost intolerable. The Visp Valley, the Matterhorn, the Breithorn, Riffelhorn, and a score of other peaks are magnificent objects, doubtless, but, looked at day after day from one point of view, are apt to become a little tiresome. This is more particularly so when the weather is somewhat unfavourable, and there is little to do but look at the mountains while one hangs about the observatory in hopes of getting a shot at the sun. "How exquisitely lovely!" said a sentimental lady tourist, as she looked along the valley to the mountains beyond; "I could gaze upon it for ever." I said nothing in reply, but not being in the best of tempers at the time, I thought a great deal.

This is a nice beginning, is it not, Mr. Editor? But then this is a bad day for my work, and my liver is out of order. Now to business.

My first piece of work was to erect the observatory. The shape of it is that of the triangular prism. The ends were formed by screwing together three pieces of 2½-inch timber, each piece being 10 feet 6 inches long. These triangular frames were temporarily propped up at a distance of twelve feet apart, and were then joined by a strong beam at the top. Two similar beams of the same length were fixed along the sides at a height of about four feet from the ground. This was all that consituted the framework, and it combined lightness with rigidity. At the four corners narrow iron feet, about ten inches long, were screwed on, and by the help of a cold chisel were firmly let into the solid rock of the little hillock behind the Riffel Hotel. Strong ropes attached to iron tent pegs furnished additional security, and with the aid of a native labourer the framework wassoon together, and soon secured. To put on the covering was a more difficult matter, as a strong breeze was blowing. It would not do to wait for the wind to lull, however, and with "pure cussedness" it continued until the last stitch of canvas was firmly fixed in its place. Then, of course, the air became still. To the side beams, a length of Willesden's waterproof canvas was fixed with battens; its width, 4 feet 6 inches, allowing just to reach the ground, to which it was attached by cords passing through eyelet-holes, and tied to iron pickets driven into the rock. A large sheet of the Willesden canvas, 13 feet square, formed by sewing three widths together, completely roofed the rest of the structure. This was battened on to the top beam and on to the rest of the framework on the North side. On the Southern side, the bottom part of the canvas was fastened between two strips of wood tightly screwed together. Ropes attached to the ends of the wood, passing through eyelet holes in the sides, and over little pulleys on the top beam, enabled the canvas to be drawn up, exposing a space 12 feet long by 6 feet high. The telescope was thus free to be pointed at the sun throughout the best working portion of the day, from sunrise to about three o'clock in the afternoon. The Eastern end of the observatory was then covered with two overlapping pieces of canvas, entrance being obtained by drawing them apart. The dark-room, a separate structure, was attached to the northern end. Its size is 6 feet by 4 feet 6 inches, and was formed by battening Willesden cardboard roofing on to a light framework of wood. The reader will perhaps remember that this same material, a capital one for dark-rooms, was used on Caroline Island, and served its purpose well. On the night when we were all washed out of our beds, mine was the only set of instruments that escaped a wetting; and when we left the place, the little cardboard hut was presented to the Kanakas, and is probably still serving them for a country residence, as, unlike more civilized people, they do not object to being crowded.

The tent once erected, the telescope had to be put in position. My man was a young, and, to all appearance, slightly-built fellow, and I was preparing to get some one

to assist him in carrying the parts on to the mound and into the tent. He did not seem to think much, however, of taking two hundredweight on to his shoulders for a short distance of thirty or forty yards, and the work proceeded with far greater ease than I had anticipated. The part of the equatorial stand that carried the polar axis, and which had to be taken to pieces at Zermatt, gave me a little trouble, as I had to put the cogs and friction-rollers on again, as well as repair the clock. With this exception, all my work was straightforward. The essential part of the instrument, the coronagraph, which was expressly constructed for the occasion, is nearly twelve feet long, and consists of a mirror of six feet focus, and stopped to three inches diameter, giving an image of the sun nearly three-quarters of an inch in diameter. Before reaching the mirror, the light passes through a long tube with a number of diaphragms a short distance apart, in order to stop reflection from the sides of the tube, and to minimise diffraction. The light is then reflected from the mirror, and the sun's image is brought to a focus at about the centre of the instrument, where it is allowed to fall on the ground glass or the dark slide, the latter being carried on a circular piece of apparatus, about twelve inches in diameter, containing a revolving shutter which passes just in front of the plate.

To get the tent and instrument erected and adjusted was a matter which occupied some little time, and before everything was finished, bad weather set in. The tent had then to stand some very rough usage, but its shape and the way in which it was fastened down enabled it to resist the strong wind that blew, without suffering the slightest damage. For the first few nights it caused me some anxiety, and even now I look to the ropes every night before retiring to rest, to see that all is safe; but I have little fear of it now, unless that tornado comes. I flatter myself that it is rather ornamental than otherwise, and it has excited considerable curiosity. Of course I dignify it with the title of observatory, and believe I am right in saying that it is the highest in Europe. A German artist who is studying here, however, declines to give it the same high-sounding title, and calls it "the Wigwam." I am glad to say, though, that it does not offend his sense of the "eternal fitness of things;" in fact, he says that the wigwam only wants a squaw to render it perfect.

It was only natural to expect that even among the members of the household here, my erection should give rise to a little misapprehension. They knew I was a photographer, and the idea entered into the minds of some of them that I was going to start a business, for landscapes at least, even if not for that branch of photographic high art which finds expression in the utilization of tin sheets and brass frames. One morning I was woke at five o'clock with a prereemptory message from two American gentlemen who wanted a photograph taken. Now I do not mind them waking me at five o'clock on a fine morning—in fact, there is a standing order here to that effect—but it is quite another thing to be roused at the order of a gentleman who wants his picture taken. It did look a fine morning, and of course I got up, venting my wrath upon the unfortunate domestics, the most innocent getting the largest share of it. For a brief period terror reigned. The American gentlemen, as soon as matters were explained, amply apologised, with the explanation that believing I was a professional photographer, they did not think they were taking an unusual course, it being the custom in America to regard the photographer as entirely the servant of the public. I do not know what my professional friends in England think of this, but I rather fancy they expect to have a say in the matter as well.

It was a remarkable morning. Beneath one's feet was one wide ocean of cloud, the billows of vapour, with their gentle undulations of light and shade, lapping the sides of the peaks that rose above them like a rocky shore towering abruptly above the sea. "I wanted you to photograph me in the middle of this." Great Scott! Is this the American sense of the eternal fitness of things?

But the beautiful view soon disappeared. The mists rose from the valley, and for the rest of the morning we were bathed in cloud. The sight was a very fine one while it lasted, and one may excuse the elegant expression of another American gentleman, who said, "I was darned near kickin' myself for coming up here last night, but I guess I'm satisfied now."

As the reader will have guessed already, the weather has not been very favourable for the particular class of observations I came here to make. There have been no blue-black skies as yet, of which I was in hopes; and even when bad weather or clouds have not obtruded themselves, the freedom from glare has not been so marked as in previous years, according to the opinion of annual visitors to this part. There has been a very marked haze, almost a halo, round the sun, of a light copper-coloured hue, and I have been asked by many people whether it is due to the dust from Krakatana, the supposed cause of the brilliant sunsets last autumn. That it must be due to suspended particles in the atmosphere at a high altitude is certain, but there have been no red sunrises or sunsets here to connect it with the cause put forward for the displays of the latter part of 1883. I hear from England that a similar reddish haze has been observed in Spain.

The plates I use are backed with asphaltum dissolved in benzine, to prevent halation from the back of the plate. I do not know of any substance that acts so powerfully in this respect, and though other media may be more than sufficient for such work as interiors, it would be difficult to beat asphaltum for astronomical work. My most promising results have been obtained on chloride plates, but slight defects in the apparatus—defects which I have now eliminated, or nearly so—have rendered my task no easy one apart from unfavourable atmospheric conditions. Under the circumstances, therefore, I trust I shall be excused from expressing any definite opinion as to what the result of my expedition is likely to be.

It was my intention to have described here a little photographic excursion I took upon a day which was unfit for my solar work, and showed no promise of improving. This letter is already so long that I must leave my visit to the Gorner Glacier for my next communication.

FRENCH CORRESPONDENCE.

Artistic Copyright Law — Colour Photometer — Photography in Colours—Article in "Figaro"—Freeing Gelatine from Grease—Preparing and Preserving Sensitized Paper—Shutters—Concentrated Solution of Pyrogallic Acid—Photographic Camera and Dark Box.

Copyright Law.—The law with reference to artistic copyright passes through singular phases. Presented for the first time before the Chamber of Deputies, it was not allowed to be brought on: then referred back to the Senate by M. Bardoux, it met with great opposition. So many objections were raised, that at this pass M. Bardoux, finding his original proposition completely distorted, demanded that the subject should be dropped. As to the article concerning the copyright of photographic works, it has not been discussed yet, and it is to be hoped that when it is taken up photography will fare as well or better than M. Bardoux's proposal intended. The more one thinks about it, the more it seems likely that photography will need to have a law of exceptions made. The wisest thing to be done would be to group all the graphic arts together, no matter how the results are produced.

Colour Photometer.—Since MM. Tailfer and Clayton on the one side, and Capt. Abney, Dr. Vogel, and others, on the other, occupy themselves in making plates capable of reproducing colours in their relative tones, it seems to me

that a photometer for colours should have a place among instruments of photographic research. A transparent solar spectrum seems as if it should form an excellent actinometer for testing the nature of sensitive products. One can quickly see, with this transparent scale containing the colours of the spectrum, which are they that allow the luminous source to act upon more or less. An easy method of constructing such an actinometer consists in the use of sheets of coloured gelatine, ranging from the violet to the red, passing through the various colours of the spectrum. The strips, stuck on glass in the desired order, are applied when in use to the sensitive film to be tested, and solar or any other light allowed to pass through the coloured strips.

M. Baudran's Invention.—An inventor, M. Baudran, of Versailles, must be taken as seriously in earnest. This happy mortal is said to have discovered a substance sensitive to light, so that by mixing it with all the oil colours necessary for the picture, and submitting a film of this substance to solar action behind a negative, a composition results in the colours found in the picture. Here the sun does not make the colours, but places them in their proper places and relative tones. From what I have seen of the process, I do not feel authorised to speak with much certainty. In the meantime, the solution of the problem of photography in colours is as far off as ever.

Article in Figaro.—The *Figaro*, at the instance of *XIX*ième *Siècle*, and other daily journals, gives a photographic propaganda, and so much the better, only it must not be permitted to say that with our regretted friend Monckhoven rests the invention of gelatino-bromide, an invention, continues the journal, of which the public ought to have been allowed to profit gratuitously. The inaccuracy is too flagrant to be overlooked.

Freeing Gelatine from Grease.—In accordance with a method indicated by Dr. Vogel for freeing gelatine from grease, there was a pretty long discussion at the Photographic Society of France, on the doubtful efficacy of washing in distilled water. It was proposed to wash in pure benzole, and also with a mixture of 1,000 parts of benzole and 250 of alcohol. It is certainly inconceivable that water alone will suffice to detach the grease adhering to the surface of the gelatine.

Formula for Sensitized Paper.—To preserve sensitized paper it has been again suggested that albumenized paper should be floated for four or five minutes on a bath of 1,000 parts of distilled water and 150 parts of nitrate of silver. Then when dry it is placed sensitive face upwards on the surface of a bath of citric and oxalic acid.

Instantaneous Shutters.—Instantaneous shutters seem to be of mushroom growth, and unfortunately come forth in greater quantity than quality. This time M. Braun, of Angoulême, produces his shutter of circular form, while M. David shows a tubular one somewhat similar, if my memory serves me, to a shutter brought out two or three years ago by M. Candèze.

Concentrated Solution of Pyrogallic Acid.—M. Audra has been trying to make concentrated solutions of pyrogallic acid. He first made a twelve per cent. solution of sulphite of soda, and another containing one-tenth of sulphuric acid. The two solutions are mixed, and eight grammes of pyrogallic acid, so that the concentration is one gramme in fifteen cubic centimetres of liquid.

M. Keller's Photographic Apparatus.—M. Keller has brought out a camera of very light construction, and a dark box in which twelve plates may be superposed. The arms are encased in sleeves impervious to light, and the exposed plate is removed to the back of the box, a sheet of black paper being interposed between each plate. This bag system is, however easy to describe, somewhat inconvenient in the use.

LEON VIDAL.

Review.

DIE MOMENT PHOTOGRAPHIE, Von Prof. Dr. J. M. Eder. (*Wien: Verlag der Photographischen Correspondenz*).

DR. EDER'S monograph on instantaneous photography forms a readable little work of eighty-two octavo pages, and deals especially with those modifications of every-day work which are necessary for the production of the so-called instantaneous photographs.

Of course it will be quite understood that the term "instantaneous photography" is a vague one, although by it one generally understands a photograph of moving objects taken in such a short time as not to show blurring or indistinctness in consequence of the motion. The maximum time allowable in making an instantaneous photograph consequently varies considerably, according to the rapidity with which the moving body shifts its position, its distance from the camera, and the direction of its motion; but one may set down about one-tenth of a second as the longest exposure allowable for an "instantaneous" picture, while in some cases the exposure may be as short as a two-hundredth or even a one-thousandth of a second.

The following data will be useful to the beginner as approximately indicating the longest term of exposure in fractions of a second, which is ordinarily allowable under certain given circumstances:—

Distance of the moving object from camera in terms of the focus of the lens.	Distance traversed by moving object in one second.		
	1 metre	5 metres	10 metres.
100	1/100	1/500	1/1000
500	1/20	1/100	1/200
1000	1/10	1/50	1/100

In the case of this table, one may regard the metre as being equal to a yard; and inspection will show that if a horse is moving at the rate of five yards per second at a distance from the objective equal to 1,000 times the focal length, a sufficiently sharp image is obtained if the exposure is one-fiftieth of a second or less; if, on the other hand, the horse is only at a distance of 100 times the focal length of the lens, the exposure must be reduced to one five-hundredth of a second.

Numerous illustrations of apparatus are given, and several examples of difficult instantaneous work are to be found in Dr. Eder's book; the frontispiece being an excellent collotypic reproduction of Lugardon's "Diver."

Something of value may be gathered from this, Dr. Eder's last work, by everyone who is engaged in photographic pursuits.

Correspondence.

THE KEEPING OF GELATINE PLATES.

SIR,—For the information of your correspondent who enquires "How long will gelatine plates keep?" I may inform him that I have recently exposed and developed several plates given to me by a manufacturer to keep and test. I have had them exactly three and a-half years, and find them in every respect as good and sensitive as when first received. If well packed and kept dry, I believe plates will keep indefinitely.—Yours truly,

T. G. WHAITE.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 7th inst., Mr. W. H. PRESTWICH in the chair.

Mr. A. COWAN, referring to Farmer's reducer, said it was quite as efficient for chloride as bromide plates; not only could an over-exposed positive be reduced, but the tone would become slightly warmer.

Mr. W. B. B. Wellington cousidered the colour very much improved in some cases.

Mr. W. Coles showed two very much under-exposed negatives which were badly fogged; these had been somewhat improved by treating with dilute ferri-cyanide and hypo reducer, but he was unable to remove all the fog, as Mr. Wellington had done on a former occasion.

The Chairman thought the reason Mr. Coles had not succeeded so well as Mr. Wellington was due to the plate having dried in the first iustance, and not in the second.

A question having reference to the compositiou of such leather as is usually employed by camera makers, and its influence in producing fog, was next discussed.

Mr. W. E. Debenham said fog did not proceeed from anything in the composition of the leather employed, but there might be some action from the paiut used to cover it. If it were worth enquiring into the chemical composition involved, then it should be that of the material used in covering.

Mr. Cowan exhibited a frame containing chloride transparencies from uegatives taken at the outiug on Bank Holiday. The subjects were well chosen, and, viewed as transparencies, were all that could be desired.

Mr. J. Smith passed round one of Singhi's 5 by 8 vignetting frames. The peculiarity consists in having a millboard frame large enough to cover an ordinary priuting frame, leaving the central portion open to be covered by a mask of suitable size and shape. By means of grooves these masks can be moved either vertically or horizontally, thus conferring a universal movement to the vignetting shield, so that any portion of a negative may be printed from. To obviate the harsh results obtained with some negatives when the mask is too close, horizontal bars are iuserted at either end, thus raising the vignetting arrangement the required distance.

Mr. Cowan had shown a similar sort of thing some months ago; all the actions were the same.

Mr. Debenham said his printing presses were similar, only he had no projecting parts.

The Chairman nsed blocks of wood bevelled underneath, instead of cardboard, and it was mentioned that it was an advantage to cover the bevelled portion with tin-foil.

A desultory conversation then took place on the subject of second-hand lenses. One member showed an old orthoscopic lens which was unmistakably genuiue, yet it was found to give very imperfect definition, which could uot be improved by the use of a small stop. It was thought that the workmen must have mixed the lenses wheu fitting the mounts, as the front lens was found to give good definition when employed with another of shorter focus.

Mr. W. Turner showed several negatives and positives on paper from drawings of large size, the lines being perfectly rendered. These were obtained by contact printing on salted paper sensitized on a 45-grain silver solution, the fixing bath being very old hypo solution. Some good examples of ferro-prussiate paper printing were also shown. To obtain positives from drawings on thick paper, the paper was brushed over with a mixture of lard and turpentiue, the proportions of these substances being determined by experiment.

Edinburgh Photographic Society.

The annual excursion aud picnic of this Society took place on Thursday, July 10, when about sixty ladies and gentlemen visited the grounds of Arniston House, by the kind permission of R. Duudas, Esq. On arrival, luncheon was served, and this was followed by the company being photographed in a group under the fine old leaning larch tree, which, as indicated by the nurseryman's bill, still preserved, was planted in 1735. A small stringed band provided excellent music for dancing. There was an interesting series of competitions for both sexes. In the following list of successful competitors the name of the donor, and nature of the prize, are placed in brackets :—

High Leap ...	1. Mr. Calder ...	(Mr. Bertram—Pipe).
	2. Mr. M'Kean ...	(Mr. Dougall—Series of 12 Carbon Prints).
100 yards Race ...	1. Miss Mary Tunny	(Mr. Bartram—Parasol).
	2. Miss Tunny ...	(Mr. Dougall — 12 Carbon Prints).
150 yards Race ...	1. Miss Pearson ..	(Mr. Crighton — Handbag).
	2. Miss Raynor ...	(Mr. Middlemas — Box Digestive Biscuits).
150 yards Race ...	1. Mr. Calder ...	(Mr. M'Kean — Illuminated Album).
	2. Mr. M'Kean ...	(Mr. Middlemas — Box of Albert Biscuits).
Barrow Race ...	1. Miss Taylor ...	(Mr. J. M. Turnbull—Graphoscope).
	2. Mr. Dougall ...	(Mr. Johnston—Pair of Skates).
Hopping Race ...	1. Miss Raynor ...	(Mr. Cox—Album).
	2. Miss Pearson ...	(Mr. Dougall — 1 doz. Carbon Prints.
Photographic Competition—Best "bit" taken in the Grounds at Arniston ...	1. Mr. Briglmen ...	(Mr. Baillie — 1 Bottle of Brandy 50 years old).
	2. Mr. M'Kean ...	(Mr. Wardale — Opera Glass).

Dinner was served at 2 o'clock, the President (Mr. Wm. Neilson) occupying the chair, and proposing the usual loyal toasts.

Mr. Wm. Dougall gave "Prosperity to the Society and the health of the President," which was happily replied to by Mr. Neilson.

Mr. Brodie gave "The Council and Office-bearers," replied to by Mr. Bashford, Hon. Sec.

Mr. John Gardner proposed "The Committee for the Picnic," coupled with the name of Mr. John Wardall, the convener, who suitably replied.

Mr. J. G. Tunny proposed the health of Mr. Dundas, of Arniston, who had personall/ welcomed the Society to his grounds, and granted every liberty and accommodation.

Mr. Dundas had studied photography thirty years ago under Mr Tunny, and was much pleased to see the Society at his place.

Mr. Crighton gave "The Ladies," replied to by Mr. Scott.

Several of the company took views of favouritc bits of scenery in the magnificent grounds. Some groups of Mr. Dundas and his daughters were taken, and the sturdy figure of one of the keepers served several for a picturesque model. After a most enjoyable day, the party returned to Edinburgh by the 7.13 p.m. train.

The Essex Field Club.

On an excursion through the earthquake region, some of the members of the above Club took cameras and exposed plates; but it was soon apparent that much had been done in the interim to repair damages, and to the local photographers belongs the credit of securing immediate and accurate records of damage done. A few things had been overlooked, which Mr. J. Spiller and Mr. Thorp at once endeavoured to supply. Foremost in this category were the ruius of St. Botolph's Priory, Colchester, where an arch had tumbled in, and a smaller portion of masonry fallen from the face of the buildiug. Views of these were taken from three points, showing the broken surfaces and the grotesquely iuterlaced stems of ivy.

A group was taken of the members of the Club as they assembled under the walls and round the tower of the old castle in Colchester. This building does not show structural damage, although it had a good shake, as evidenced by many of the objects in the Museum becoming displaced.

Mr. R. Meldola, ex-president, took occasion to address the members, giving the salient points of the report he is preparing, and referred to the fact that through all this wreck no lives were lost.

Leeds Photographic Society.

The ordinary monthly meeting of this Society was held on Thursday, August 7th, Mr. J. W. Ramsden, vice-president, in the chair.

After the confirmation of the minutes,

It was proposed by Mr. Marshall, and seconded by Mr. Branson, that the committee be requested to arrange for out-door excursions not less than once a month, nor more frequently than once a fortnight; the announcements of the excursions to be made on the Society's board in the window of the Phil. Hall, and kept two or three weeks in advance; the place of meeting and time to be arranged as best suiting the excursiou.

The meeting then arranged that an excursion should be made on Saturday, August 16th, to Mranwood Valley and Adel Moors, to meet at the "Three Horseshoes," Headingley, at 2.30 p m.

Mr. F. W. Branson called the attention of the meeting to some chemical reactions involved in the treatment of the bleached

image of a negative (produced by bichloride of mercury), with a half-saturated solution of recrystallized sodium sulphite.

From experiments made, the following facts were deduced :—

1. That a solution of bichloride of mercury is not reduced to calomel, nor is a sulphide formed when cold solutions of bichloride of mercury and recrystallized sodium sulphite are mixed.

2. That freshly-formed and washed silver chloride is not blackened, but is dissolved to a very appreciable extent by a solution of sodium sulphite of the strength recommended.

3. That mercurous chloride (calomel) is readily blackened, with production of a sulphide of mercury, by a solution of sodium sulphite.

It was explained that the white image caused by the action of a solution of bichloride mercury consisted of both mercurous chloride (calomel) and silver chloride, and that when sodium sulphite solution was added, the silver salt dissolved, and the mercury salt became blackened to form the photographic image. The removal of the silver salt probably explained the small degree of intensification given by this method, as contrasted with some other methods in use. That a strengthening of the image does occur is certain, and that no part of the plate is discoloured except the photographic image constitutes an important advantage.

It was also pointed out that a fact of considerable practical importance remains to be proved—viz., whether a sulphide of mercury as produced by the action of sodium sulphite, &c., or the amido compound as yielded by treatment with ammonia, gives the most permanent negative.

After a short discussion on Mr. Branson's communication, in which the Vice-president, Messrs. Teesdale, Thorton, Wildy, &c., took part—

Mr. W. L. Wildy passed round some prints on ferro-prussiate paper, and recommended the process as useful in a number of ways, and gave the following details as to his mode of working the process :—

Ammonia citrate of iron	15 drs.
Distilled water	8 ounces
Ferricyanide potas....	10 drms.
Distilled water	8 ounces

Mix the two solutions, and keep in a darkened bottle. Take unglazed paper of a fine grain, and damp the sheets you propose to sensitize. With a sponge or rubber brush float the solution over the paper as evenly as possible, and hang to dry in a darkened room. Do not prepare a larger quantity than you are going to shortly use, as the paper becomes slower by keeping. When printing, expose until the shadows assume a strong metallic grey colour, and detail begins to be lost. Wash well in cold water until, when held up by the corner, the drip from print shows no yellow tinge. If it is desired to write on the print, use a saturated solution of common washing soda as ink, and a clean steel pen to write with.

The Hon. Secretary (Mr. Thos. W. Thornton) then exhibited samples of Willesden paper, and spoke of the many uses photographers might put it to. Being perfectly water-tight, it could with advantage be used to form developing dishes, and also for making temporary dark-rooms. He said that by the kindness of Mr. Ashman, he had received samples of the vulcanized fibre respecting which enquiries had been made at the last meeting ; these he exhibited, and said he had been experimenting with them, and found that it was practically unbreakable, and could be worked in almost any conceivable manner ; he had grooved, planed, turned, and sawn it with great ease, and he was of opinion that it might with advantage be used to replace ebonite in the making of shutters, &c.

Mr. Branson said he had used the material, and found that it was affected by damp.

The Hon. Secretary also exhibited a changing bag for dry plates, which he had made after the design given by Mr. Brooks, and used it every day during a recent tour.

The meeting then proceeded to the examination of a number of transparencies, exhibited by Mr. W. Teasdale by means of the sciopticon lantern. Mr. Teasdale's portable screens, &c., were much admired.

Royal Cornwall Polytechnic Society's Exhibition.

The following is a list of the awards made in the Photographic department of the above Society. A detailed report will appear next week.

Professional Photography. — First Silver Medal. — W. W. Winter, W. Gillard, and H. P. Robinson.

Second Silver.—Geo. Hadley, L. Berry, and T. J. Dixon.

First Bronze.—W. P. Marsh.

Highly Commended.—J. Milman Brown and R. Faulkner.

Amateur Section.—A. Pringle—1st Silver Medal ; A. G. Tagliaferro—2nd Silver Medal ; W. J. Graut—1st Bronze ; P. H. Emmerson—2nd Bronze ; P. H. Emmerson—Highly commended.

Photographic Appliances, &c.—Second Bronze Medal.—F. B. Dajley and R. R. Beurd.

Talk in the Studio.

The Meeting of the British Association.—The mail steamers of the Allan Line sailing from Liverpool are at present crowded to their utmost capacity by members of the British Association *en route* for Montreal to take part in the meetings of the body, which commence in the Canadian city this month. The arrangements made for the reception and entertainment of the English visitors appear to be of a very complete description. The Canadian Government have voted £5,000, and reception committees have been formed not only in Montreal itself, but at Toronto and Winnipeg, which will be visited in due course by the members.

Another Lime Light Explosion in a Theatre.—A most serious accident, which may be attended with fatal consequences to one of the sufferers, occurred on Thursday night, the 7th inst., at the Curragh Camp. About eleven o'clock an explosion occurred at the theatre attached to the garrison canteen, a wooden building, filled by an audience to see "Maria Martin." Just as "the murderer" shot his victim, some limelight was being lighted, when a fearful explosion occurred. Private Jennings, of the 1st Royal Dragoons, had his right hand and part of his wrist shot off, and was so stunned that he has not recovered conciousness yet. The medical officers amputated his hand and part of his arm, but, although a strong man, his case is critical. Mr. Clarence, who played the part of Corder, is severely hurt, and was deaf for hours afterwards ; his arm is shattered. Miss Beaumont, who played the part of Maria Martin, was severely injured, and was with difficulty brought round. Some fifteen or twenty people were removed to hospital, but nearly all were allowed to leave the place after being treated. It is said that iron bottles were used.

Iridium.—This metal, the oxide of which forms one of the most intense black vitrifiable pigments, and which is used in enamel photography, has several more or less important commercial uses, of which a tolerably full account appeared in a recent number of the *English Mechanic*. We make the following extracts :—"Gold pens of the best quality are tipped with iridium, as are some of the stylographic pens, the extreme hardness and utter indifference to acids of the iridium rendering it very useful for the purpose. Iridium is generally found alloyed with either platinum or osmium, and the chief sources of the supply are the Ural mines in Russia, and certain districts in California. When cold it is brittle, but at a white heat it is slightly malleable. It is fusible only in the oxy-hydrogen blast or in the electric arc. Insoluble in all the simple acids, it is slightly acted upon by aqua-regia after the grains have been heated for some hours. Though the chief sources of iridium are the Ural Mountains and California, the metal is, in fact, widely distributed, but in the shape of platin-iridium occurs generally in the form of small cubes with rounded edges, and as osmiridium or iridosmine in flat irregular grains, or occasionally in hexagonal prisms. The gold-pen makers examine these grains with a magnifying glass, and pick out those suitable for pointing their pens. These are soldered to the nibs and slit with a copper disc charged with diamond dust and cotton-seed oil. Gold pens so finished are known as diamond-pointed, but, as a matter of fact, it is a particle of iridosmine with which the nibs are tipped. A few years ago, however, Mr. Holland, being engaged in the manufacture of the Mackinnon stylographic pen, found it necessary to procure some larger pieces of iridium than the dust yielded, and after many experiments he discovered that by adding phosphorus to the ore while at a white heat, he could obtain perfect fusion, and pour and mould the alloy into any desired shape. For his special purpose Mr. Holland cast the phospho-iridium in sheets between slabs of iron, and breaking the sheets into irregular pieces, soldered the latter to strips of brass, and

ground the iridium alloy to a flat surface by means of a copper lap charged with diamond dust. Drilling is accomplished in a somewhat similar manner, except that the hole is first started with a diamond splint. As soon as a little cavity is made, a drill fashioned out of soft copper wire is brought into requisition, and the little cavity being fed with diamond dust and oil, the hole is gradually worked through, though not very speedily, in spite of the fact that the drill runs at a rate of 3,500 revolutions per minute. Besides points for pens, the iridium alloy is used in making draw-plates for the production of wires of the precious metals. Wires of common metals are drawn through holes in a steel plate, but ruby plates are often employed for drawing down gold, platinum, and silver into wires. The ruby is very hard, but not harder than the iridium alloy, which has, moreover, the great advantage that it is not liable to splinter or chip by the rough handling or the heat engendered by the drawing operation, which is about the best example of intense friction. Iridium is also used for the knife-edges of chemical balances, and is steadily supplanting agate; but in that case it is the mere edge, which is firmly soldered to a brass piece attached to the balance. The hypodermic needles of the surgeon are also now made of gold tipped with iridium, and in many cases where extreme hardness is required with freedom from corrosion, the iridium alloy is coming into use. For the contact points of telegraphic and other electric apparatus, iridium is supplanting platinum, because it is found to last much longer, and to be almost perfectly free from oxidation or sticking, while the points can be readily cleaned by rubbing with a piece of emery cloth. Iridium was tried by Edison for making incandescence lamps, and it has also been tried with some success as the negative of an arc-light; but in both cases it may be safely assumed that it is not likely to supplant the simple carbon, the cost being altogether out of proportion to the advantage gained. Attempts have been made to deposit iridium on base metals by the galvanoplastic method, but not much success has been attained. There is a promising field for experiment in this direction, for a successful method of plating with iridium would be very valuable.

Photographic Club.—At the next meeting of this Club, on August 20th, the adjourned discussion on "Printing through Coloured Media" will be held. Saturday afternoon outing at Chingford, leaving Liverpool Street Station by the first train after two o'clock. Meeting afterwards at the "Forest Hotel."

To Correspondents.

*** We cannot undertake to return rejected communications.

Pierre Revon.—It appears to us that the spots are due to a trace of silver nitrate from the paper finding its way to the gelatine film through minute holes in the varnish. The tendency towards the formation of such holes is much reduced by thoroughly washing the negatives so as to remove all traces of hyposulphite, and very perfectly drying the films before varnishing. Even when the perforations in the varnish film exist, the staining of the underlying gelatine does not take place very readily if the sensitive paper is perfectly dry.

J. J. Dickenson.—Thank you for the description, which we will make use of shortly.

F. Brown.—1. The lubricating medium or paste is made by dissolving one ounce of white wax cut into shreds in five ounces of warm oil of turpentine, and a very little is applied by means of a piece of flannel. The burnisher should be warm and perfectly smooth. 2. White wax or solid paraffin is best. Lay the paper on a heated slab of glass or slate, rub over with wax, and remove the excess with a soft cloth.

T. B.—1. The remainder will be none the worse if reasonable care has been taken. 2. Probably it has been exposed to sulphurous fumes—perhaps from an open drain.

A Subscriber from the First.—We cannot tell you of a firm in Milan that will supply you with what you require, but when you arrive there you will douhtless be able to gather all the information you require by referring to the directory. 2. We believe that a book on the subject can be had from Newman, Artists' Colourman, Soho Square.

J. H. H.—1. In the case of the two small pictures, it seems to us that the indistinctness is due to the camera or lens having moved, not the boats; look carefully to the action of the shutter in order to find what causes the movement. 2. There is as much difference as could be expected, and we think that No. 3 is the best. If, however, you had used a somewhat less active developer, the result would have been more satisfactory.

L. Y. X.—Undouhtedly he may and can do this; but it is not quite the correct thing.

C. E. Lyon.—Clean the mirror, and make your drawings with a crayon of French chalk.

Pin.—1. Throw it away and make a fresh solution. 2. For small plates an ordinary Albion press will answer very well, but it will only serve for a plate of about one-fourth the size of the typographic forme it takes. 3. Ordinary yellow wax melted with about one-third its weight of fine black-lead. 4. Soak them in the following:—Water one gallon, sulphuric acid one pint, biebromate of potassium one pound. 5. Dry it at a lower temperature. 6. Yes, it is useful when the reticulation will not take place without. 7. They are printed from stone by an ordinary lithographic machine.

C. Osborn.—Plain collodion is the correct thing; but iodized may be used if ready to hand, as the iodising salts dissolve out and do no harm.

Wm. G. Honey.—The plates you mention are excellent, but that is no reason why you should not try how you can get on with those of other makers.

Fifteen Years' Subscriber.—Probably from the presence of some deleterious matter in the mounts. Cut a print in two, and mount one portion on one of the mounts you previously used, and the other on one of those now in use. If the portion on the fresh mount becomes spotted, you have sufficient grounds to ask for compensation from the firm supplying the cards.

T. P.—We will endeavour to give you the information you require in a private letter.

Exhibitor.—Full particulars regarding the International Inventions Exhibition of 1885 appeared more than a month ago in the Photographic News (page 418), together with the classification of exhibits bearing on photography.

Cambria.—1. If you paid the money for the plate, it is undoubtedly yours; but if you merely paid for the engraving of the plate, you cannot claim it. 2. Try first as it is: the result in such a case is often far better than one might expect.

John Jones.—1. You have evidently become a little confused as regards nitrates and nitrites; but in the case you refer to, the nitrate alone is used. 2. Add rather more water, perhaps one-third more.

The Photographic News Registry.

Employment Wanted.

Assistant Operator & Retoucher.—R. H., *Photo. News* Office.
Reception-Room for a learner.—M. E., 16, York-pl., Scarboro'.
Mounter & Spotter (lady).—H. V., *Photo. News* Office.
Artistic Retoucher, experienced & first-class.—J. S., *Photo. News* Office.
Mounting & Spotting.—A. A., c/o Mrs. Pavithy, High-st., Hadley, Barnet.
Assistant Printer.—H. W., Elm Cottage, Grove-rd., Richmond.

Employment Offered.

Head Printer, understand Carbon.—Annan, 153, Sauchiehall-st., Glasgow.
Retoucher, Lady or Gentleman.—F. Guy, 70, Patrick-st., Cork.
Good Oper. & Ret.—T. Williams, Talbot-pl., Darlington-st., W'hampton.
First-class Printer & Toner.—West & Son, Eagle House, Gosport.
First-class Operator, permanency.—Mr. Owen, Catherine-st., Salisbury.
Assistant Retoucher.—Ball & Co., 13, Narrow-st., Peterboro'.

Photographs Registered.

Mr. Jabez Sumner (Oxford)—2 Photos. of Rev. H. P. Hughes.
Mr. R. F. Blackett (38, Woburn Square, W.)—Photo. entitled "Dolce far niente."
Mr. A. G. Gibson (Penzance)—2 Photos. of Longships Lighthouse.
Mr. W. G. Lewis—3 Photos. of Roman Bath at Bath.
Mr. R. J. Houlson (Abergavenny)—2 Photos. of Father Ignatius and others.
Mr. S. Kirk (Nottingham)—Photo. of Notts. Cricket Team.
Mr. J. S. Green (37 Tything, Worcester)—3 Photos. of Rev. Canon R. Cattley
Mr. S. Thorn (Bude House)—3 Photos. of "Elizabeth Moore Garden" Life Boat; 1 Photo. of Chaple Rock, Bude Harbour.
Mr. W. McLean (Hunstanton, Norfolk)—2 Photos. of Lieut. R. Wells.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1355.—*August* 22, 1884.

CONTENTS.

THE TONING OF COLLODIO-CHLORIDE PRINTS.

DR. LIESEGANG, who has given much attention of late to the production of prints on collodio-chloride, and whose recent paper—published on page 772 of our last volume—has caused many persons to occupy themselves with this method of printing, has recently published some instructions for toning such pictures, and the substance of these instructions we now propose to place before our readers.

A solution of acetate of soda in water to which chloride of gold has been added some time before the commencement of the work of toning—in fact, a similar bath to that used for prints on albumenized paper—has proved excellent for collodio-chloride prints. It is not well to commence by preparing a bath containing a whole 15 grain tube of gold in two or three pints of water, as such a solution loses its toning power in some days, and one has no alternative but to add more gold; so that it is far more rational to add the gold gradually, and, in commencing, not to use more than is required for the number of prints to be toned.

To act according to this method one must prepare two solutions:—No. 1 containing an ounce of fused acetate of soda to a quart of water, and No. 2 containing fifteen grains of gold chloride to a pint of water. No. 1 is the stock solution, and is, of course, used over and over again, and from time to time the gold solution is added as required.

The gold solution should be added to the acetate of soda bath about an hour before the toning solution is required for use—more or less being added according to the number of prints to be toned, or the tint required; and it is easier to judge of the progress of the toning by looking through the prints than by merely looking at the surface. Experience alone will enable a judgment to be formed as to how much gold will be required for any given tone; but in the working it must be remembered that collodio-chloride prints tend to tone quickly. The prints may be directly transferred, and without rinsing, into the fixing bath, which should be made with about three ounces of "hypo" to a quart of water.

Five or six minutes suffice for the fixing, and less washing will suffice than is usual in the case of prints on albumenized paper.

PACKING NEGATIVES FOR SENDING BY RAIL.

IT requires no consideration to at once see that if a negative is to be sent by any of the ordinary means of conveyance, it must be so packed as to stand the maximum of ill-usage to which goods in transit are ordinarily subjected; and we all know that those who have the handling of rail or post packages are by no means tender-handed.

In ordinary cases a small negative is considered quite safe if enclosed in a moderately strong wooden box with a thickness of one-eighth of an inch of soft paper—such as the so-called *papier Joseph*—intervening all round between the glass and the wood. Although it is contrary to the postal regulations to send glass by post, a very large number of negatives enclosed in boxes are sent to and from enlarging houses packed in this way, and a fracture is by no means common: but it sometimes happens that the wood forming the top or bottom of the box will so far bend under the action of a vigorously applied post stamp as to strain the glass of the negative to the breaking point. This risk can, however, be tolerably well guarded against by wrapping the box in black paper, and putting both address and stamps on a small label or tally attached to one corner of the box; of course no one would think it worth while to stamp on the black paper. It is also just conceivable that, if a box containing a negative, packed as described, were thrown violently across a room—by no means an uncommon thing in the case of both rail and post packages—that the jar or shock might fracture the glass; and a very simple and effectual means of guarding against fracture from such a cause was brought before our notice the other day, when we received a small negative (half-plate) which a friend had sent to us from a distance. The negative was packed with a soft paper in a wooden box, a distance of about an eighth of an inch being allowed between the wood and the glass; but in order to render it practically impossible to communicate a dangerous shock to the wooden case, this was packed in an ordinary hat box, ropes or coils of soft paper serving to preserve at a proper distance the outer and inner case. Not only is a hat-box likely to command the nearest thing to consideration which a parcel agent or post official may be expected to possess, but such a package as we have referred to can hardly take any harm by being thrown about, as the bulk is so great in proportion to the weight as to preclude the notion of damage; while even if the hat-box were "pancaked" under a large packing case, the negative inside would stand a good chance of being uninjured.

A band-box thus backed is within the limits of weight and bulk imposed by the conditions of the Parcels Post, but the fact of there being no guarantee and no registration, prevents many persons from sending really important negatives by Parcels Post.

A delivery agency, such as Sutton, or the Globe Express, will accept responsibility up to ten pounds, or more if insurance is paid, and a receipt can always be obtained if a form is made out ready for the receiving clerk to sign. Instead of packing a negative in a box, it is a very good plan to send it in a portable printing-frame—that is to say, if the printing-frame is true, and the rebates are lined with rubber—the frame being, of course, itself protected

over the face with a board, and packed in some material calculated to diminish any shocks to which it may be subjected.

That there are people who will feel surprise at serious consideration being devoted to such a subject as the safe packing of negatives we are fully aware; but these persons are doubtless those belonging to the numerous class who, when they have to send a negative away, simply put it with a letter in an ordinary envelope, perhaps with a piece of cardboard on each side, but oftener without. We receive many negatives so sent—or rather, we should say, the fragments of them.

In conclusion, one may consider that security in transit is best ensured by a box within a box, the interspace being filled with a soft material, and by making the whole package bulky in proportion to its weight. Perhaps our readers will remember how some of the magnificently crystallized specimens of certain chemical preparations were sent from Germany to the International Exhibition of 1862. The order was this, commencing with the centre:—1. Group of crystals resting on a tray. 2. A set of gym-balls similar to the arrangement ordinarily used for swinging a mariner's compass. 3. Stretched rubber springs. 4. The outer case.

By-the-Bye.

WATER AND ITS IMPURITIES.

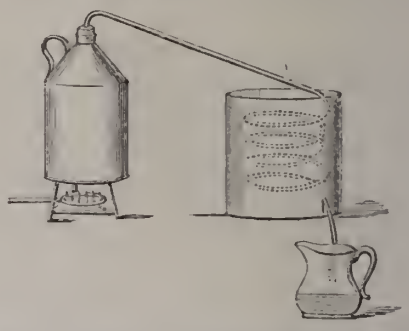
The alchemists dreamed and talked of that universal solvent which they so long and vainly endeavoured to discover; still, for all this, not only the alchemist of old, but his more immediate successor, the chemist of to-day, has found no solvent so universal as water. No liquid has nearly so wide a range of dissolving powers, and, taking things all round, no liquid exercises so slight an action upon the bodies dissolved—evaporate the water away, and the dissolved substance is obtained in an unchanged condition; at any rate, this is the general rule.

The function of water in nature is essentially that of a solvent or a medium of circulation; it is not, in any sense, a food, yet without it no food can be assimilated by an animal. Without water the solid materials of the globe would be unable to come together so closely as to interchange their elements; and unless the temperatures were sufficiently high to establish an igneous fluidity, such as undoubtedly exists in the sun, there would be no circulation of matter to speak of, and the earth would be, as it were, locked up or dead.

When we look upon water as the nearest approach to a universal solvent that even the astute scientist of to-day has been able to discover, who can wonder that it is never found absolutely pure in nature; for wherever it accumulates it dissolves something from its surroundings? Still, in a rain-drop just formed we have very nearly pure water; but even this contains dissolved air to the extent of about one-fiftieth of its volume, and as the drop falls downwards it takes up such impurities as may be floating in the atmosphere; so that if our rain-drop is falling immediately after a long drought, it becomes charged with nitrate or nitrite of ammonia and various organic matters—perhaps also the spores or germs of disease. Thus it will be seen that rain tends to wonderfully clear or wash the atmosphere, and we all know how much a first rain is appreciated as an air purifier, and how it carries down with it valuable food for plants. The rain-water, in percolating through or over the land, flows mainly towards the rivers, and in doing so it becomes more or less charged with mineral matter, lime salts and common salt being the chief of them; while some of that water which has penetrated more deeply into the earth takes up far more solid matter than is ordinarily found in river water. The bulk of this more or less impure water tends towards the ocean, taking with it its load of salt and lime. Constant evaporation, of course, takes place from the surface of the sea, so that the salt and lime accumulate, this latter being, however, ultimately deposited as shells, coral, and chalk; while nearly pure, or naturally distilled, water once more condenses in the form of clouds. This process, by which a constant supply of purified water is kept up in the natural economy, is imitated on a small scale when water is converted into steam by the action of heat, and this vapour is cooled so as to reproduce liquid water, the operation in question being known as distillation.

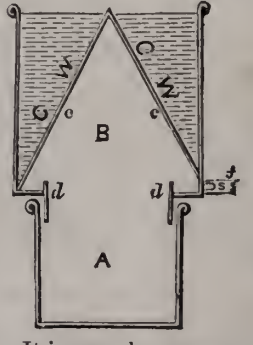
For this purpose an apparatus known as a still is required; and although by law one must pay an annual licence fee for the right to use a still, it is not usual for the Government authorities to enforce the law when a still is merely used for purifying water.

One of the best forms of still for the photographer to employ consists of a tin can or bottle in which the water is boiled, and to this a tin tube is adapted by means of a



cork, one end of this tin tube terminating in a coil passing through a tub or other vessel of cold water. A gas burner, as shown, is a convenient source of heat, and in order to ensure a complete condensation of the vapour, the water in the cooling tub must be changed now and again.

Sometimes the vapour is condensed by being allowed to play against the inside of a conical cover which is adapted to a saucepan, and is kept cool by the external application of cold water; and in this case the still takes the form represented by the subjoined diagrams; such compact and portable stills being largely employed in Ireland for the private manufacture of whisky.

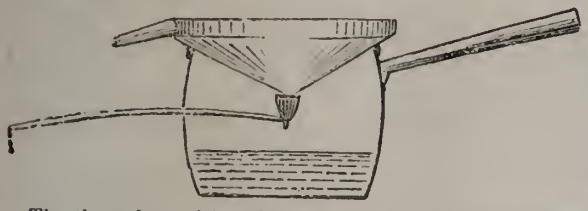


It is scarcely necessary to say that the condensed water trickles down on the inside of the cone, and flows out at the spout.

An extemporised arrangement of a similar character may be made by passing a tobacco pipe through the side of a tin saucepan as shown in next page, and inverting the lid of the saucepan; if the lid is now kept cool by frequent changes of water inside it, and the pipe is properly adjusted so as to catch the drippings from the convex side of the lid, a considerable quantity of distilled water may be collected in an hour or so.

The proportion of solid impurities present in water as ordinarily met with is extremely variable; rain water

which has been collected towards the end of a storm contains only a minute fraction of a grain per gallon, while river or spring water may contain from less than thirty grains per gallon or so and upwards. Ordinary sea water generally contains from three to four per cent. of saline matter, but that of the Dead Sea contains nearly one-fourth of its weight of salts.



The three impurities of water which most interest the photographer are lime or magnesia salts, which give the so-called hardness; chlorides (as, for example, chloride of sodium or common salt), which throw down silver salts; and organic matter, which may overturn the balance of photographic operations by causing premature reduction of the sensitive silver compounds. To test for them is easy. Hardness is easily recognisable by washing one's hands in the water, the soap being curdled; but in many cases one must rather seek for a hard water than avoid it, as the tendency of gelatine plates to frill is far less in hard water than in soft water. It is, indeed, a common and useful practice to harden the water used for washing, by adding half an ounce or an ounce of Epsom salts (sulphate of magnesia) to each bucket of water. Chlorides—chloride of sodium or common salt being that usually met with—may be detected by adding a drop or two of nitrate of silver to half a wine glass full of the water, a few drops of nitric acid being then added. A slight cloudiness indicates a trace of chlorides, and a decided milkiness shows the presence of a larger quantity. If it is wished to get a somewhat more definite idea of the amount, it is easy to make up a series of standards for comparison, by dissolving known weights of common salt in distilled or rain water, and testing samples of them side by side with the water to be examined.

Organic matters may be detected by adding a little nitrate of silver to the water, filtering off from any precipitate of chloride of silver, and exposing the clear liquid to sunlight; a clean stoppered bottle being the most convenient vessel to use. The extent to which a blackening takes place may be regarded as approximately proportionate to the amount of organic matter present.

Filtration on a small scale is not altogether a satisfactory mode of purifying water, as organic impurities often accumulate in the filter, and enter into active putrefaction when hot weather sets in.

FURTHER PARTICULARS REGARDING THE ACTION OF COLOURING MATTER ON GELATINE EMULSIONS.

BY DR. J. M. EDER.

I HAVE already recognized the fact that iodeosine acts more favourably than bromeosine; and I have recently made experiments with the so-called commercial eosine colours, as "yellow eosine," "blue eosine," "yellow erythrosine," "blue erythrosine," and "Bengal rose." The results of my experiments prove that "yellow eosine" (bromeosine) and "Bengal rose" possess a less decided action on a bromo or bromiodo emulsion (made with ammonia), than is the case with "blue eosine" (iodeosine), or erythrosine. Moreover, the band of the greatest action in the yellow was found to be nearer the orange when the "blue eosine" and "blue erythrosine" were used than when the colouring matters of yellow tint were employed; these results corresponding to the absorption bands.

In the case of all these colouring matters ammonia exalts the general absolute sensitiveness, and the sensitiveness for the yellowish-green in particular. If one, for example, soaks plates for two minutes in a solution of ·08 to ·12 gramme of eosine, erythrosine or "Bengal rose" in 100 cubic centimetres of water and 3 cubic centimetres of ammonia, the band of "yellow sensitiveness" is almost doubled in breadth.

An interesting experiment is to determine whether, in such a case, the bromide of silver is itself coloured: and, indeed, one may freely wash eosine plates with water without causing them to lose their "yellow sensitiveness," as is proved by the experiments of Attout, Clayton, and Schumann; but as so small a quantity of eosine as is scarcely sensible to the eye will give yellow sensitiveness, these experiments must not be taken as conclusively proving the case. I therefore separated the bromide of silver from an ammoniacal emulsion which had been treated with eosine, by the aid of Pleuer's centrifugal machine, and washed it repeatedly with water, so that the liquid finally came away colourless. Notwithstanding this, the bromide of silver possessed a faint reddish colour, and it did not lose this by further washing. This bromide was once more emulsified in gelatine, and the plates prepared showed the characteristic band of "yellow sensitiveness." After development and fixation the plates were slightly reddish.

This proves that the colouring matter holds firmly to the grains of silver bromide; or, perhaps, rather to that gelatine which the bromide holds enclosed. In such a case the gelatine may be regarded as acting as a medium between the silver bromide and the colouring matter, in the same kind of way that protein bodies serve to fix colouring matters on cotton fibre.

That bromide of silver fixes gelatine in some way, when it ripens, is proved by the following experiment. Bromide of silver was separated from an emulsion by means of Pleuer's centrifugal apparatus (PHOTOGRAPHIC NEWS, 1882, page 257), and thoroughly washed with water at 140° Centigrade; after which it was dried, the combustible organic matter being determined by ignition, and restoration of the reduced bromide by the usual means. One hundred parts of bromide from boiled emulsion proved to contain ·45 of gelatine; and in the case of another experiment with ammoniacal emulsion, ·52 per cent. of gelatine was found. A cold emulsion, which was prepared with much water and little gelatine, so that the bromide could settle, gave a bromide containing ·93 per cent. of gelatine.

The sensitiveness of bromide of silver may—among other causes—be due to the gelatine thus intimately united. As to a chemical combination between the bromide and the gelatine one can say little; indeed, it is difficult to believe in such a combination, as one must assume a compound of one molecule of gelatine with several hundred of silver bromide, and this is contrary to our general experience of similar protein compounds—as, for example, the silver compound of albumin, which contains equal molecules of albumin and silver nitrate.

Practical Papers for Beginners.

No. 6.—MORE ABOUT DEVELOPMENT.

IT is supposed that the beginner has returned from his outing with a collection of plates, some or all of which may have been over-exposed, under-exposed, or correctly exposed; but in order to have a fair chance in developing such a collection, it must be assumed that notes have been taken as to conditions under which the exposures were made.

Let us begin with a slide containing a couple of plates,

both having had the same exposure. Unless the photographer has a notion that the exposure was too much or too little, he will naturally try one of the plates with the normal developer, or equal parts of the following solutions:—

No. 1.—Developing Solution.

Strongest liquid ammonia ...	½ fluid ounce
Bromide of potassium ...	70 grains
Water	1 pint

No. 2.—Developing Solution.

Pyrogallic acid	60 grains
Water	1 pint

To begin with, let us assume that the trial plate shows signs of extreme over-exposure—that, in fact, it appears to blacken immediately all over under the action of the developer, and the resulting image is very thin and weak, although all, or nearly all, details are visible. In such a case the mere increasing of the proportion of No. 2 will not sufficiently retard the development of the second plate, it being necessary to add an additional proportion of bromide as well; and the following method of working will probably answer. Make up a standard solution containing ten per cent. of bromide of potassium as follows:—

No. 3.—Bromide Solution.

Bromide of potassium	1 ounces
Water	9 ounce

An ounce or so of this should be kept ready for use in a spirting or dropping bottle, such as is figured below;

the cork being perforated, and fitted with a short length of tube, contracted slightly at the outer extremity. To contract the tube a piece of double the required length is held in a gas flame till the middle portion is softened; force being then applied to stretch it out until it is sufficiently contracted. When cold, a file-scratch is made at the narrowest part, and a little strain causes it to snap at the scratch; the perforation in the cork may be made with a rat's tail file. The spirting bottle being held in the right hand, the jet is moved or swung rapidly towards the mouth of one of the developing cups, and suddenly stopped, a few drops of the fluid being ejected in consequence; and for the same bottle and tube, the quantity thus thrown out at each spirt is approximately equal. Let us suppose it to be half-a-dozen drops, and that a first trial is made with six spirts, which may represent about four grains of solid bromide. Three ounces of pyrogallic solution or No. 2 are next added, when one ounce of No. 1 (which we will suppose to be already poured out in another glass or cup) is mixed in. The plate is now flooded with this mixture, and if, even under these circumstances, the image appears to come too rapidly, the developer should be poured back into the glass, and more of the restraining bromide solution must be added a still further addition being made if circumstances appear to indicate the necessity. If, in spite of the above treatment, signs of over-exposure are apparent, and a third plate which one may judge to have been similarly over-exposed is among the batch, a preliminary treatment with potassium bromide solution is advisable, the plate being immersed for a few seconds in a ten per cent. solution, and afterwards developed with the normal developer (equal volumes of No. 1 and No. 2).

The above directions will make it clear that the remedies for over-exposure may be placed in the following order, the mildest measures being placed first on the list, and the mode of treatment for the most extreme case of over-exposure being placed last.

1. An increase of the proportion of No. 2 solution—say to the extent of three times the volume of No. 1.

2. The addition of a ten per cent. bromide solution (No. 3). From two to twenty drops to each ounce of developer.

3. The plate to receive a preliminary soaking in a ten per cent. solution of potassium bromide for a few seconds or longer according to circumstances.

Now let us assume the reverse case—namely, that the first or trial plate has been under-exposed, and that the mere increasing of the proportion of No. 1 solution is not sufficient to bring out a passable picture. In this case the developer is poured back into its glass, and some of the following is added from a spirting bottle:—

No. 4.

Strong ammonia solution	1 ounce
Water	9 ounces

The spirting bottle used for the above ammoniacal solution should be different in shape or size from that employed for No. 3 solution, as otherwise mistakes are likely to occur. Additions of ammonia may be made at intervals, the liquid being poured back into the glass each time ammonia is added. A point will be reached at which either the required detail will be brought out, or else a faint brown tint will appear all over the film, and after this one can do no more. The universal tinting produced by forced development may be distinguished from that arising from over-exposure by the circumstance that in the former case no details are to be found in the shades of the subject. It must, however, be understood that for extreme under-exposure there is no remedy; while extreme over-exposure may be controlled if the fact is known previously. In some cases two-thirds of the bromide, or even more, may be omitted from No 1 solution when a plate has been over-exposed; but it occasionally happens that plates will not stand this treatment, a general fog or darkening being the consequence.

There are other modes of development—as, for example, that with ferrous-oxalate—but it is, perhaps, better for the beginner to confine himself to one method, and for this reason we shall, in our next practical paper, treat of printing from the negative.

ROYAL CORNWALL POLYTECHNIC SOCIETY.

This Society opened its doors on Tuesday, August 12th, for the fifty-second annual Exhibition, and, as will be seen, the Society is getting into years. Until a few years ago it confined its Exhibition to the Polytechnic Hall, but, owing to the increased number of exhibits, the Society has been obliged to engage other premises in conjunction with its own. This year the spacious Drill Hall was engaged for machinery in motion, &c, whilst the Polytechnic Hall has been confined to the fine arts, such as painting (oil and water), photography, art pottery, sculpture, carvings, &c.

The Exhibition opened at eleven o'clock, a.m., when the building was very soon filled. The presidential address was given by the Right Honourable the Earl of Mount Edgcumbe, who was accompanied on the platform by the Revs. Canon Phillpotts, C. W. Curlyon, G. Bull, W. Iago, A. H. Malan, F. Cole, J. Mayne, Sir John St. Aubyn, Lord

Renshaw, General Aylmer, Colonel Curlyon, Major Ross, Major Haye, Major Pender, Captain Bridges, R.N., Messrs. T. B. Bolitho (High Sheriff of Cornwall), H. Liddicoat (Mayor of Falmouth), T. S. Bolitho, W. Cole Pendarves, Jonathan Rashleigh, Barham, M.D., Iago, M.D., Harvers, M.D., Howard Fox, Robert Fox, A. L. Fox, C. B. Beauchamp, H. V. Broad, J. H. Collins, F.C.S., R. N. Worth, F.G.S., W. Brook, and E. Kitto, F.M.S.

The President, on rising, said he was sure those present would forgive him if he performed this duty in a most formal manner, for he was sure they did not come there to hear desultory remarks from a person who had just arrived in town, and had hardly been able to look through the Exhibition. They came there to see an Exhibition of a peculiar character, which Falmouth had made its own, and of which that town and county had every reason to be proud. It was an Exhibition partly practical and partly artistic. The more practical exhibits were mostly designed for mining purposes, and were shown in the Drill Hall; but besides these they would find there an exhibition of gas lighting and heating apparatus introduced by Murdock, who was born just a century ago. Murdock at one time lived at Redruth, and was agent for James Watt, and was practically the inventor of gas lighting. The first house so lighted was his own house at Redruth, and the first large public building lighted was the Soho Works, Birmingham. The Earl then referred briefly to other sections of the Exhibition, and said the numbers and general excellence of the exhibits were, he thought, fully up to its average, and full explanation would be given by Mr. W. Brooks, to whom the Society was indebted for so fine a display in getting them together.

Sir John St. Aubyn, M.P., moved a vote of thanks to the Earl of Mount Edgcumbe, which was seconded by Mr. Jonathan Rashleigh, who said it was really a privilege to have the noble Earl presiding at any gathering, because he always brought wisdom, judgment, and discretion to bear on the proceedings. The motion was heartily assented to, his Lordship briefly returning thanks, and declaring the Exhibiton opened.

Lectures were arranged and given on scientific subjects in the evenings during the week, and a concert was also given on Thursday evening, which was well attended.

The attendance on Friday evening was very large, owing to the annual drawing of the Art Union prizes, which took place at nine o'clock, p.m.

The Art Union was established to enable professional artists and photographers to dispose of their works on exhibition. The prizes are generally allotted as money prizes, and the successful winners are bound to select any work by professional artist or photographer on exhibition, as it is well for photographers and friends of the Society to take a few shares, and by that means assist their brethren in art.

On Tuesday afternoon, at 4 o'clock, the foundation stone of the new Observatory was laid by the Earl of Mount Edgcumbe, a large and influential company being present. The building altogether is estimated to cost £1,300. After the stone had been laid, a subscription list was handed round, and £81 was promised in addition to that which had already been subscribed. The Observatory is conducted under the auspices of the Polytechnic, Mr. E. Kitto, F.M.S., being the chief observer in charge; and most of the records are made by means of photography.

Photographic Department.

Judges' Report.

The Judges have great pleasure in announcing to the Society that the exhibits of this department and its sections are fully up to the average, not only as regards numbers, but the excellence of the exhibits generally.

Of late years there has been a falling off in the professional portraiture department—that is, in the large size portraits.

The landscapes are exceedingly fine, especially since the introduction of the rapid gelatine plates, at the present time their manipulation being better understood than it was a few years since. There are a few specimens of instantaneous work which possess merit which was unattainable until the introduction of the rapid plates.

The amateur section is exceedingly well represented.

The judges call special attention to a series of large photographs of America, which possess great interest not only as photographs, but are very interesting from a geological point of view, which have been presented to the Royal Institution of Cornwall by Mr. Richard Pearce, jun., of Denvers, U. S. A.

In the photographic appliance and magic lantern department several ingenious inventions are to be found.

Professional Section.

Mr. H. P. Robinson (of Tunbridge Wells) is well represented by a large series of very fine studies in his well-known style. They are most admirable as gems of the photographic art, and each one tells its own tale, the expression and gesture of the figures being perfect. His large picture (No. 695) "The Cuckoo" carries off the first silver medal, the subject being a very difficult one, and exceedingly well treated.

Mr. W. W. Winter (of Derby) takes also a first silver medal for a portrait study, "Sad Moments," which, in the opinion of the judges, is simply perfect in pose and expression. He is also represented by several other charming studies, fully illustrating the high state of perfection in photographic art at the present day.

Mr. W. Gillard (of Gloucester) is again to the front, and has been awarded a "first silver medal" for his magnificent composition picture "The Miser," and the judges cannot speak too highly in its favour. He has also several other exhibits, which are very perfect.

Mr. C. H. C. Harrison (of France) sends three frames of instantaneous studies printed in carbon, which show careful manipulation.

Mr. W. P. Marsh receives a first bronze medal for his frame (No. 665), "High Seas" (instantaneous), which represent in a marvellous manner heavy seas breaking over beach and esplanade.

Mr. E. C. Bowker sends a frame of cabinet pictures (No. 666), some of which are very good.

Mr. F. Whaley sends some very excellent studies, the best of which is No. 667 ("This Little Pig went to Market").

Mr. J. Milman Brown is again represented by several productions, one of the best of which is "Autumn Sunshine," and is highly commended.

Mr. R. Faulkner (of London) shows a frame of very skilful studies of children in his well-known style, and also some highly finished vignette portrait studies.

Mr. J. P. Gibson sends some clever little artistic studies, principally river scenes.

Mr. J. Terras contributes some clever little studies.

Mr. A. Heudrey sends some studies of flowers; and also a river scene, "The First Bite," which is a pleasing little study, and is very highly commended.

Mr. Jno. Jackson sends three frames of views, the best of which is 696, which are of considerable merit.

No. 696, a frame of interiors of Lincoln Cathedral, by Mr. G. Hadley, has been awarded a "second silver medal," being well rendered.

Mr. P. M. Laws contributes a frame of ceramic enamels, which are well worthy of notice.

Mr. Luke Berry sends some charming pictures, both landscape and figure; to his "Llanberis Pass" has been awarded a second silver medal, being a most charming artistic production, and full of atmosphere.

Messrs. Byrne and Co. (Richmond) send some very fine portrait examples printed in red carbon, but the judges noticed several of the same studies that the firm have exhibited in former years.

Mr. G. Renwick sends two large studies of snow and frost scenes, which are interesting: and also a frame of children's portraits of merit.

The award for enlargements is a second silver medal to Mr. T. J. Dixon (of London) for a tiger; in the opinion of the judges it is the best enlargement they have ever seen from so small a negative. There is another one of an eagle equally good.

Mr. G. Honey has a very clever little composition picture, children in a boat feeding swans, and it is to be regretted that the picture is not of larger size.

Amateur Section.

The Rev. H. B. Hare sends examples of good work of river and wood scenery.

Mr. A. Pringle's productions are very perfect, and are fully up to that gentleman's former productions. To his frames Nos. 805-809 has been awarded first silver medal, and they are full of atmosphere, and the artistic treatment is perfection in every way.

Mr. A. Millar contributes a very careful figure study.

Mr. D. Barnett sends two frames of landscape and rustic studies.

Dr. T. H. Morton shows two very good interiors.

Mr. A. G. Tagliaferro sends frames of interiors, &c., to the best of which (frame 812) has been awarded a second silver medal, the subject being well treated.

Mr. W. J. Grant has been awarded a first bronze medal for a frame of his well known Polar subjects.

Mr. R. Hopkins sends three large size pictures printed from paper negatives.

Mr. P. H. Emmerson, B.A., contributes one frame of seascapes (instantaneous), to which has been awarded a second bronze medal. The same gentleman also sends two life-size pictures of heads printed in red carbon, which are highly commended.

Appliances, etc.

Mr. G. Atkinson sends a retouching desk, and Mr. F. B. Dagley a plate-washing cabinet which is well adapted for the use of amateurs, and which has been awarded a second bronze medal. The same contributor also sends a plate-box so made that the plates may be examined by the Customs without injury.

Mr. R. R. Beard (of Bermondsey) forwards a very ingenious self-centering lantern slide-carrier, to which has been awarded a second bronze medal. The same person sends also a case of safety tubes, the workmanship of which is very good. He also sends a drawing of a screw regulating the back-pressure valve and gas tap.

Review.

PHOTOGRAPHY FOR AMATEURS. By T. C. Hepworth. Price One Shilling. (*London: Cassell & Co.*)

JUST now, as the body of non-professional photographers is being rapidly recruited, it is only to be expected that the number of elementary hand-books issued will keep pace with the demand; and Mr. Hepworth has been successful in making an exceptionally good text-book for the beginner.

Ten pages serve for an abstracted history of photography, and this history is, perhaps, the weakest part of the book: after which come nearly a hundred and fifty pages of very practical matter, including, however, not much beyond the gelatino-bromide process; the description of the wet collodion process merely occupying about a dozen lines in the historical chapter; and we are here told that the collodionized plate is dipped for *several seconds* in a bath of nitrate of silver to make the plate sensitive to light.

Some remarks on out-door work may be worth reproduction. Mr. Hepworth says:—

"The success of a landscape photograph mainly depends upon the judgment with which the subject is chosen. The beginner will be apt to fall in love at first sight with any picture which he may focus on the ground-glass screen of his camera, and will probably imagine that as it looks so beautiful it is sure to make a fine photograph. But let the experienced worker peep over his shoulder for a moment, and whisper to him that the picture, pourtrayed in all its natural colours as it is, will look very different as a monochromatic photograph. Those moving clouds, with all their tender hues, and their lovely blue background, will, in the photograph, be represented by a blank white space. The brilliant carpeting of green will be almost black. That hedge bounding the field will, in the picture, be represented by a still blacker mass, forming an ugly band, separating the sky from the earth. In a word, the beginner wants educating by experience into what will and what will not make a good picture.

"Unfortunately, the power of really appreciating nature is much rarer than many people imagine. How many are there who seem to have no idea of noting the natural beauties of spots which are constantly before their eyes! One may perhaps cross the bridge over a canal every morning on his way to work, and will be familiar with the sight of the laden barge, and the patient horse toiling on the tow-path dragging it along. He may take the trouble to look at the scene, but he would laugh at the idea of there being anything beautiful about it. But show him a photographic print of the same view. He will be delighted at it; he will say that he never saw anything so beautiful. Then he will notice for the first time the ripples on the water; the reflected shadow of the girl steering the boat; the light tint of the load of straw relieved by the dark sail lying upon it: in short, he will for the first time see an artistic picture, which, when presented to him in all the wealth of colour which nature's palette affords, and with all the poetry of movement which belongs to living things, he had looked upon with a blind man's eyes."

The remarks which follow should be read by those who find all commercial plates uniformly bad; and we agree with Mr. Hepworth, that no maker who constantly, or even occasionally, supplies bad plates can hope to retain his business; indeed, we could mention instances in which dry plate manufactories have been closed in consequence of a few bad batches being sent out. Let us again quote the author:—

"I am certain that many amateur workers fail because they will persist in using different makes of plates. They perhaps admire the work of some more competent friend, when their first question is, 'Whose plates do you use?' The answer is given, and straightway a batch of the recommended plates is procured; but the work turned out by their aid is no better than before. I believe, although some commercial plates are better than others, that all are good. The man who supplied faulty ones would quickly lose his custom, and would drop out of the race. The beginner will do well not to commence by making his own, but to use commercial plates until he understands something of their capabilities."

THE SUN ELECTRIC LAMP APPLIED TO PHOTOGRAPHY.

EVER since lighting by means of electricity became practical, the idea has occurred to utilize it for photography. In fact, the new processes seemed to possess very great advantages over solar light, as the latter depends upon the state of the atmosphere, and is often insufficient in our latitude for full a third of the year.

The systems of lamps that were first used in the public streets, and which were consequently the best known, were the ones first employed, and for this reason it was the Jablochkoff

candle that, in France, served to establish those photographic installations which were attempting to make progress in a new route. Every one will remember the little gallery which was conducted by Mr. Liebert in one of the salons on the first storey at the Palace of Industry. Here the apparatus, which served to contain the electric light (which consisted of a Jablochkoff candle), and to project the same, were as yet very primitive and difficult to manœuvre. The large parabolic copper reflector was designed for concentrating the luminous rays upon a limited surface, in order to give sufficient luminous intensity to the parts of the subject to be reproduced; so nothing but busts could be taken, and, moreover, the lights and shades were extremely pronounced, and the flesh, on account of the violet rays emitted by the lamp, exhibited livid reflections whose colouration and intensity varied according to the caprices of the unstable light.

The sun lamp, which possesses all the qualities of colouration and steadiness of the incandescent light, and, at the same time, a luminous intensity as great as that given by the arc light, ought to be admirably adapted for photographic purposes. But while waiting for carriages to a distance and distribution of electricity to enter the industrial domain (which it will ere long) the management of a truly practical gallery for utilizing Mr Clerc's invention would have necessitated too great an expense, and it was a mere accident that permitted the installation to be arranged that we now have under consideration.

Alongside of the sun lamp works, in Wagram Avenue, is situated Mr. Boscher's photographic gallery, and it was therefore easy to arrange a few meters of cable to carry the current to lamps arranged for photographic operations. The steam engine is running all day long in the lamp works, and, in the evening, it is only necessary to notify the engineman to continue his work in order to have a beautiful light that permits of taking, just as in broad daylight, the most varied negatives.

The sun lamp is well known to the public, which has, at various times, had an opportunity of judging of its merits during the experiments at the Continental Hotel, on the Jouffroy road, in the picture gallery of the Exhibition of Electricity, and in the grand *foyer* of the Opera House. At present the lamp and machines are much superior to what they were at first, and it is indeed strange that this light has not found more applications in Paris, where it would give more satisfactory results than all

those that are at present illuminating the great industrial and commercial centres and the theatres and other places of amusement.

We give, in the accompanying engraving, the details of an application of this lamp to photography in Mr. Boscher's gallery. There are four of the sun lamps, and they are arranged as follows. The first is suspended from the centre of the posing room, beneath a white drapery. The illuminating surface, which is covered with a slightly ground globe, is directed toward the drapery, and the latter serves to reflect the light. The lamp, which is suspended from a longitudinal cable, may be slid along by means of a pulley, and be removed from, or brought near, the subject to be photographed, in such a way as to well light the upper part. Two like frames, which are mounted upon rollers, carry three other lamps (provided with opalescent globes), which may be placed laterally so as to send the light toward the centre of the body and that portion of the floor upon which the feet of the subject or of the persons forming a group are resting. In order to prevent the rays from falling too directly (which would give glaring whites, and shades without transparency), a large white screen of a thin, white fabric, upon which rose or other coloured gauzes may likewise be placed, is interposed between the lamps and the model. Another opaque screen is placed alongside of the objective during the operation, to prevent the luminous rays striking the gelatino-bromide plate too directly.

All the walls of the apartment, moreover, are of a very light tint, and, through the arrangements that we have just indicated, there is obtained a diffused light, whose intensity may be very easily varied at any given point. The time of exposure necessary in order to obtain good results is scarcely longer than with daylight, and the proofs of album cards that we have examined in Wagram Avenue demonstrate that hereafter lovers of beautiful photographs will not have to be dependent upon the caprices of the light of the sun.—*La Lumière Electrique.*

Notes.

The picture of every-day native life in Constantine, presented with the PHOTOGRAPHIC NEWS this week, shows a so-called "*Café Maure.*" They are bare-looking enclosures with a form or two as the only furniture. Most of the people prefer to sip their coffee couched on the bits of floor mat. The shop on the left-hand side of the picture is that of a sadler, and the holes shown over the shop are intended for ventilation.

Mr. Pritchard, referring to the taking of the picture, says:—"Here is a native coffee house, a 'Café Maure,' as it is called, for Moorish seems a term adopted by Arabs who are settled in a town. Two or three 'blankets' are squatting at the door, to give a *pièce de résistance* for the picture, and I hope to drop my shutter in time to get a few passers-by. I do get passers-by, but not a few. They come in troops. A friendly Arab shouts in French, a turbanned Turk roars in Turkish, a donkey-boy cries out in Arabic, and I holloa in English. The scene grows lively, but, thank goodness, everybody is delighted. A stalwart negro in blue breeches and gold-lace embroidery comes up chuckling, so I take him by the shoulders and push him beside the café door. Sambo enjoys the joke immensely, but won't stand. So the shutter has to fall on what it can. A second plate is pushed in; the crowd is beginning to enjoy my entertainment immensely, but they won't keep back. They think my juggling with the camera capital fun, and take it for a peep-show, evidently; they surround me closely. Again do I sally forth, and make a lane for the lens, and a second time I let my shutter drop because I must; it is a case of a crowd or nothing."

The fifth annual Convention of the Photographers' Association of America, the opening of which we announced in our issue immediately following the event, has been a great success in one way; but, perhaps, not quite as we understand success.

There was a good gathering at the opening on the 27th of last month—indeed, nearly a thousand were present—also a fine collection of photographs and apparatus, and those present had a real good festive time, but no papers of any great interest were read. Mr. W. H. Kent, the President, writes to us, under date August 1st:—"The Convention is opened, and exceeds our utmost expectations. It is a grand success, and I believe nothing approaching it has ever been seen in this or in any other country in the world. The display of photographs is wonderful."

It was such a gathering as is calculated to make a friendly feeling among the members of the craft, and there was an evident disposition to come to an understanding on the vexed question of prices.

There were two rival reports of progress during the past year handed in, and one was partly read: some amusement being created by the circumstance that advance slips had been sent out by the authors of the reports, each being represented as the genuine and veritable.

On the whole, the Convention appears to have appealed more to professional photographers than to amateurs.

Cincinnati seems to be an enviable place for photographers. According to a statement recently made by a member of the Illinois Photographers' Association, the prices obtained are very good, one firm charging ten dollars per dozen for cabinets, and another fifteen dollars per dozen. The Cincinnati photographers are sufficiently independent to do without advertising their prices, and announce them only when you enter the reception room.

Photographic riddles are not numerous, and they are not, as a rule, good. The last we have seen appeared in a Brooklyn paper, and ran thus:—"Why should the 'Foe-to-graphic' Art be called the 'Friend-to-Graphic Art?' Because it is so frequently metamorphosises dry "plates" into most interesting "pictures."

When the Queen heard of the death of Mr. Jabez Hughes, she immediately sent a letter of sympathy to Mrs. Hughes, and on the evening before the funeral she forwarded a wreath to be placed on the coffin.

The principle of McLeod's sunshine recorder (see page 483) may be applied to the making of a very convenient form of sundial, in which the spot of light which serves as an indicator travels at equal speed over its whole range. It is merely necessary to so place a long focus lens in relation to the reflecting globe that the image of the sun is projected on a suitable screen placed at right angles to the axis of the objective, and the graduation of this screen is an easy matter compared with the plotting out of the scale of an ordinary sundial. The reflecting globe may be fixed outside a window having a northern aspect, and the objective may be inside if the glass of the window is of fairly good plate.

Simple as the collotype method of printing is, there are practical difficulties, and few in this country manage to make a profit by working it commercially, while even in Germany, where collotype is very much more practised than here, it is by no means easy to get an order for ten or twelve thousand impressions executed with reasonable promptitude.

What can appear more simple or easier than to first coat a plate of glass with an adhesive substratum of albumen and soluble silicate, next to level it, and dry on a film of gelatine made sensitive by the addition of bichromate of potash? The plate is now ready for exposure under a reversed negative, and after this it is soaked in water so as to moisten those parts which are not rendered impervious to water by the action of light. It is now laid on the bed

of the press, and on applying the inking roller the exposed parts take the ink, while the damp parts refuse it; but what is of most importance, all intermediate degrees between these extremes are rendered by the adhesion of a proportionate amount of ink.

Simple as the above is in theory, we hear of troubles in practice. The sensitiveness of the gelatine film varies much according to the conditions under which it has been dried, and sometimes it becomes generally impervious to water, or insoluble. Again, the film is often figured all over by surface markings, such as those gelatino-bromide workers know so well, and these show on the print; but, worse than all, it is a common thing for the gelatine film to break up or strip as soon as the printing has been fairly commenced.

Months ago we mentioned the fact of excellent collotypes of paintings, about half-plate; and each mounted on a kind of *papier mache* plaque, embossed so as to represent a frame, being sent from Germany, being sold retail at a penny each in London. Photographs of seaside resorts are now issued in the same size and style, but we do not think our readers can get prints of this character from their own negatives at a corresponding price, as the German collotypers keep reserve plates of such stock subjects, to print when unforeseen circumstances prevent the execution of more profitable work.

Full directions for working the collotype process appear on page 642 of our volume for 1882, and Mr. Riley's simple and practical instructions, which are to be found on p. 412 of our present volume, will be found sufficiently detailed in ordinary cases.

"The Extraction of Metals from Carbon, or Substances known as such," is the strange title of a patent applied for on the 12th inst. (No. 11,170.) The applicant is a lady.

The latest novelty in the way of photograph frames is one which it will be easy to develop further. The notion we allude to consists in so arranging the velvet covering the frame that it assumes the shape of a bonnet, in relief, around the face of the carte or cabinet portrait. The face of the Princess of Wales, which we have seen thus framed, admirably suited the style of bonnet into which the folds of velvet had been shaped, and the effect in this particular instance was charming.

It is easy to see how this idea can be developed. Clever manipulation will doubtless result on the similar modelling in velvet, not only of ladies' hats of varied shapes, but of Glengarry caps, military helmets with plumes, &c., and many other descriptions of masculine head-gear. Nor is there any reason why the "fad" should not be developed downwards, and the photograph frame become in effect a kind of velvet costume, cut in the latest mode, in which we shall dress, rather than frame, the portraits of our friends.

One advantage which might follow is obvious. Photographic likenesses, as it is, become old-fashioned, not so much because the faces of the sitters change, as because sartorial *modes* change so rapidly and completely. If, then, we can in future bring up a portrait to date by merely putting it in a newly-devised costume frame, the current life of our cartes and cabinets will be certainly prolonged.

Germany sends an exploring expedition to Congo. The chief of the expedition, Lieutenant Schultze, has undergone a course of instruction in photography at the Technical High School in Berlin, and takes a good equipment of photographic necessaries. The exposed plates will be sent to Berlin for development.

The death of Mr. W. H. Mummler, of Boston, merits passing reference from the fact that his name became notorious some years ago in connection with a lawsuit he had to sustain for making spirit photographs. Several well-known English photographers whom we could name were at the time inclined to believe there was "something" in spirit photographs. It would be interesting to know what their opinion is on the subject now-a-days.

The "Healtheries" next year gives place to the "Inventories," in which photography will of course form a part. In looking over the long list of photographic patents for the last quarter of a century, and noticing the vast number which never had any practical outcome, and the number, almost as large, which had become obsolete, one is tempted to ask whether the authorities intend to lay down any rule as to what is, and what is not, worth exhibiting. And this difficulty will not be confined to photography. To prevent the admission of "fads," or of useless inventions, the services of an expert in each branch will be almost indispensable.

Editors can definitely fix the arrival of the silly season "without referring at all to the date box or the almanack. The day's correspondence unmistakably marks the period in the calendar which has been arrived at. Thus, when last week we found amongst our letters a card on which "A Correspondent from the First" ('tis ever thus!) asked whether Nicephore Niepce and Talbot were "at Daguerres drawn"? We knew only too certainly that the era of the big-gooseberry had dawned, and that the voice of the sea-serpent would soon be heard in the land.

The *Photographic Eye* is now issued with a page half the size of the earlier numbers—it being at present about the size of the *Graphic*; so our remark made three weeks ago about the inconvenience of binding the numbers for reference no longer applies. Mr. C. Gentilé evidently intends to make the Chicago weekly a leading journal on the other side of the Atlantic.

The Registrar-General's ledger for the present year should contain a fresh page in order to take account of the

recent death from looking too long at the sun. Few, however, are likely to commit the same folly as the lad Gee, who, in trying how long he could stare at the great luminary, found he could not endure it for quite a minute. He died the same evening after much suffering.

A series of about fifty photographs of the recent tricycle camp at Harrogate has been produced by Mr. Welford, of Birmingham, and the '*Cyclist* seems to think it wonderful that such "beautifully clear and expressive pictures" should have been obtained by the photographer, "despite the brilliant sunshine he had to contend against."

Brilliant sunshine is just what every photographer would like to contend against when he takes pictures of a tricycle camp.

In the effort to get out of the common-place, some very curious things were perpetrated in the early days of photography. A man with a bare neck and chest, and a table-cover thrown over his shoulders, immediately became a "study," though it was difficult to see where the "study" came in. A lady with a lace shawl on her head was considered more picturesque than if she had the same shawl arranged in the ordinary fashion. All kinds of drapery were pressed into service, and gentlemen who had the misfortune to have beards, and ladies who were equally unlucky in having pretty faces, were tortured into every conceivable attitude to satisfy the yearnings of the photographer after "fancy pictures." The photographer is more sensible now-a-days, and is contented if he can represent people truthfully as they are.

The sale of terra-cotta plaques ornamented with a photographic view from nature is assuming such large proportions that one firm has more than four hundred varieties of them on sale. The making of the *plaques* has given quite a fillip to the trade of the terra-cotta ware manufacturing companies at Watcomb, near Torquay.

HOW TO PHOTOGRAPH MICROSCOPIC OBJECTS

BY I. H. JENNINGS.

Introduction.

Photo-micrography is the art of making, by means of the microscope, photographic enlargements of microscopic objects. Properly employed it forms a valuable tool in the apparatus of the scientific worker, for, by its aid, he can record faithfully the results of difficult and delicate observations, or delineate the forms of minute bodies concerning whose true structure different observers may vary in opinion. A photo-micrograph allows no room for play of the imagination: it simply shows how a given object appeared at the time the observation was made. Seriously carried out, and more especially when using high powers, photo-micrography is hard and trying work. The arrangement of the apparatus, the placing and illumination of the object, are tedious and difficult. Beginners in this fascinating and important art are warned that they must be prepared to encounter not only all the difficulties and troubles incident to ordinary photography, but also others of a different nature peculiar to photo-micrography.

To become a skilful photo-micrographer it is first necessary to be a skilful microscopist; for if the operator does not know how to display an object to the best advantage, his photographs will be useless. Yet the microscopist who comes fresh to photographic operations will find himself in a sea of troubles, spoil a number of plates, produce failure after failure, and, perhaps, throw up photo-micrography in disgust. The writer would advise all who contemplate a beginning to first make themselves acquainted with landscape photography, and all ordinary photographic manipulation: this need involve little extra expense, and the profit and pleasure to be gained from this course will amply repay any little additional outlay. One of the most skilful photo-micrographers that the writer ever knew was a gentleman who employed the microscope regularly as an instrument of research, but who used the camera only on his holiday trips. Being engaged in writing a paper which required illustration, it occurred to him to try photo-micrography, as the objects which he wished to depict were beyond the skill of the engraver. He did so, and succeeded at once.

Beginners in photo-micrography should bear in mind:—1st. That they should themselves develop every plate they expose; 2nd. That the best results need not be expected unless they are also able to make their own silver prints. A professional photographer may be A1 at landscape and portrait work, but this does not show that he is fit to be entrusted with negatives of microscopic objects. To bring out the details of a photo-micrographic negative of a print properly, requires that the operator should thoroughly understand the nature of the object; and this cannot be done except by a microscopist.

All objects are not suited for photo-micrography. Very opaque ones are not the worst, but those which have any strong tint of red, brown, or yellow. On this account many beautiful insect preparations cannot be photographed successfully; and we would, therefore, advise the beginner to study the preparation of microscopic objects, so as to be able, in case of need, to prepare and mount his own objects. As an example, a fly's tongue forms a pretty microscopic object, and most of the slides met with are tolerably good; yet a photograph taken from these ordinary slides usually is a complete failure. The reason is, that the unequal transparency of the object makes some parts over-exposed, while, in the darker parts, the detail has not impressed the film. Here, the best way is to make, or have made, a special preparation.

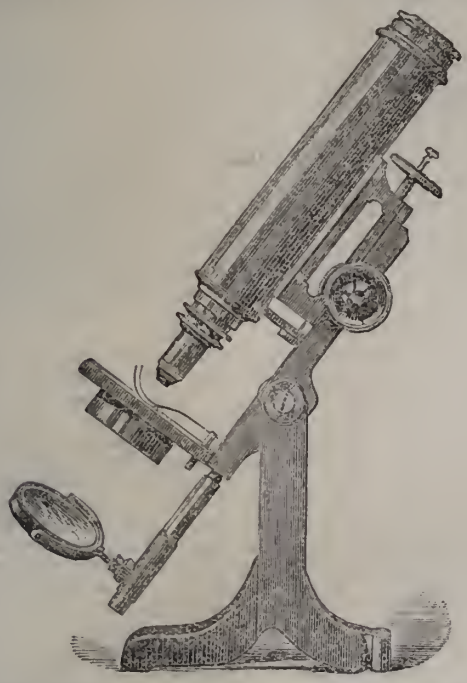
Lesson I.—Microscopical Apparatus.

Any good microscope stand may be employed for photo-micrography. It must be really good: an inferior instrument is useless. It must be firmly and solidly built, and the fine and coarse adjustments should be of the best construction. One of the cheap microscopes, with a fine adjustment that gradually moves the object from the field of view on being turned, will be found a source of continual annoyance, and should be avoided. If the student have, by ignorance or ill-advice, one of these things, let him part with it at any price, and procure one of the low-priced, but firmly built, well-adjusted stands made by Beck, Collins, Ross, or Swift. These will be found to give ample satisfaction.

The stand figured on p. 539, made by Mr. Collins, of Portland Street, is well suited to photo-micrographic work. It is well made, takes the full-sized eye-pieces, is furnished with a good one-inch and quarter-inch, and costs, with case, only £5 10s. A beginner could not have a better instrument. The writer uses a stand by Swift, which has a coarse adjustment so good, that a $\frac{1}{12}$th or $\frac{1}{16}$th inch may be focussed with ease and precision with it alone. The shape of the microscope is immaterial; both Ross and Jackson models will give good results if well made. A graduated draw-tube should be obtained, which had best be velvet-lined, to prevent flare. The usual dead black, after a while, wears out of the draw-tube, and

renders the microscope useless for photography; thus a more durable material, such as cloth or velvet, should be used to prevent reflection from the sides of the tube.

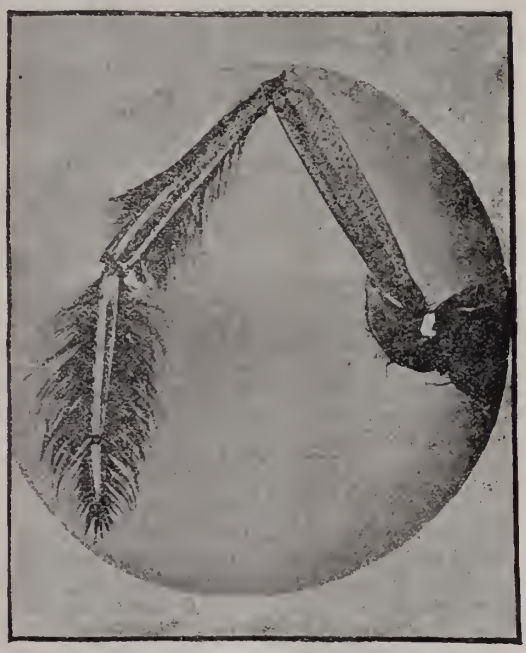
Several of the continental models, such as Hartnack's, would be useful for photo-micrography, from their compact shape and solidity; but their narrow body-tube, which



limits the field of view most seriously, and cramped stage, render it advisable to use only English instruments of the latest pattern. If cost be no consideration, then there is nothing to equal one of the large, first-class microscopes of the best English makers, fitted with every possible convenience in stage and sub-stage. It is true, an expert manipulator will obtain excellent results with the simplest arrangements; but it is no less true that it is the expert alone who can really appreciate and turn to good account the delicate mechanical contrivances which the skill of the optician has devised for his aid. Thus, a mechanical stage is not absolutely necessary, but it is a great help when working with high powers; and with the very highest powers, it is hard to see how it can be dispensed with. The same may be said of the sub-stage; but as this is in some respects more generally useful than the mechanical stage, it should be applied to all microscopes with which an achromatic condenser or paraboloid is to be used. The objections to the tube-fitting usually supplied with student's microscopes are, the difficulty of properly adjusting the sub-stage apparatus, and the very thick upper stage that they necessitate. For photographic work, the upper stage should be as thin as possible, certainly not more than $\frac{1}{8}$-inch thick, for frequently very oblique light must be employed, and this cannot be done with a thick stage, which cuts off the rays. Using a thin stage and bull's-eye lens, it is astonishing how easily a difficult diatom may be resolved, which, with a thick stage, would require the use of an expensive condenser. Most of the English makers now fit their microscopes with thin concentric stages, even when rack-and-pinion movement is omitted.

As to lenses, the student is advised strongly to buy the very best, if possible. Let him shun cheap French lenses, more especially the separating lenses, styled "French buttons," which are frequently supplied with £5 or £6 microscopes, and which are only useless rubbish. The stand and lenses should be purchased separately: the latter to suit the requirements of the photo-micrographer. If the very best lenses are too expensive, then purchase some of the cheap low-angle lenses, now sold by most good makers, for these, being well corrected up to the angle ascribed to them, are capable of performing a vast amount of real work. The beginner will probably find them much easier to handle than lenses of wider aperture, owing to their greater penetration and working distance; but the more experienced worker will require, especially for photographing very minute objects, lenses of the widest possible angle. Lenses of wide-angle admit more light, and have far greater resolving power than lenses of low-angle; but they have less working distance, and less penetration. The fact that they almost touch the object, in many cases, when in focus, forms no objection to their use for photography, but it is annoying to have a lens, say a $\frac{1}{2}$-inch, that will only show the surfaces of objects. This objection, however, can be easily disposed of, by using a contracting diaphragm, such as the "Davis Aperture Shutter," made and sold by Mr. Collins, whenever penetration is desired. The use of this shutter renders a lens of widest angle equal to any low-angle lens, as far as penetration is concerned; while even with the shutter, the wide-angle lens will give superior definition and admit more light than a low-angle lens of the same focus.

The choice of lenses will depend, in a great measure, on the photographic work to be performed. If the beginner proposes to limit himself to the photography of comparatively easy objects, lenses of 2-inch, 1-inch, $\frac{1}{2}$-inch, $\frac{1}{4}$-inch, will suffice. A $\frac{1}{4}$-inch of wide-angle will be found capable of resolving the majority of test-objects satisfactorily. A



LEG OF WATER BOATMAN (NOTONECTA).
Taken with a Ross' 4-inch.

5-inch or 4-inch will be found very useful for photographing large objects, such as whole insects, wood sections, and anatomical preparations; while if the student requires a few high powers, and cannot afford the expensive ones of the best English makers, he will find the moderate-priced immersion lenses of Seibert equal to all the work that will generally be required of them. These lenses are sold by Baker, of Holborn. Immersion lenses are specially useful in photography, as they admit a vast amount of light, and are, therefore, very rapid in action.

Some lenses are not well suited to photo-micrography, their visual and actinic foci not being coincident: that is, when an object is focussed accurately on the screen of the

camera, and a photograph taken, the picture will be found indistinct and blurred, owing to the fact that the rays forming the visual image do not lie in the same plane as those forming the photographic image. Such lenses *may* be used for photography, by making experiments, and determining the amount of allowance for this difference to be made when focussing; but it is far more satisfactory to use lenses which do not require such correction. The writer has used lenses by Ross, Wale, Swift, and Siebert, and the visual and actinic foci were coincident in all such as he has used.

Much difference of opinion prevails as to whether the eye-piece should or should not be used in photo-micrography. Some assert that the eye-piece spoils good definition. This is possible with a bad eye-piece; but the writer has for years used the eye-piece when photographing with low powers, and has found no difficulty in obtaining photographs absolutely sharp and well-defined to the very edge of the field. This is also the experience of many other photo-micrographers. In the writer's opinion it is a mere question of convenience: with low powers—say up to ½-inch—the eye-piece may be employed, as the loss of light attending its use is very slight; but with higher powers the loss becomes a serious matter, so it is then necessary to discard the eye-piece, or focussing will be very difficult, and the exposure of the plate inconveniently long.

An achromatic condenser is a very useful piece of apparatus, but may be dispensed with for general work; however, a good one will save much labour and "dodging" when using high powers with difficult objects. A bull's-eye lens accompanies most microscopes, and is really invaluable when the photo-micrographer has learnt how to use it. For a very oblique light a hemispherical lens is as good as anything. It is attached to the under-side of the slide with glycerine, and used in conjunction with the bull's-eye, the best position being found for the lens by experiment. As it will not keep in place unless the microscope be kept vertical, a slip of cardboard should be fastened to the slide below the hemispherical lens, or a little gum may be added to the glycerine. Unless the gum be perfectly white, it had best be avoided, as a yellow tint would ruin definition.

The paraboloid and spot-lens are sometimes used in photo-micrography, but even with the most rapid dry plates, dark-ground illumination is difficult, and seldom successful. As it, however, shows many objects to better advantage than any other mode of lighting, the student is recommended to see what results he can gain by its use.

Patent Intelligence.

Applications for Letters Patent.

11,212. JOHN V. ROBINSON, 39, Lower Sackville Street, Dublin, for "Photographic cameras."—Dated 13th August, 1884.

11,274. JAMES BOOKER BLAKEMORE WELLINGTON, 55 and 56, Chancery Lane, Middlesex, for "Improvements in changing boxes for photographic plates."—Dated 14th August, 1884.

Patent Sealed.

4144. WILLIAM BLAIR ANDERSON, of 26, Union Terrace, Aberdeen, in the county of Aberdeen, Scotland, Photographer, for "Improvements in colouring photographic prints."—Dated 29th February, 1884.

Patents on which the Seventh Year's Renewal Fee of £10 has been Paid.

1957. FREDERIC NEWTON, of Fleet Street, in the city of London, Optician, for an invention of "Improvements in magic-lanterns and in the lamps to be used therewith."—Dated 18th May, 1877.

Specification Published during the Week.

8643. BENJAMIN JOSEPH EDWARDS, of 6, The Grove, Hackney, in the county of Middlesex, Photographer, for "Coating photographic plates or paper with gelatine emulsion."—Dated 5th June, 1884.

My invention relates to an improved method of, and apparatus for, rapidly applying an even layer or coating of gelatine emulsion to sheets of glass, metal, paper, or other surfaces, for photographic purposes. In carrying out my invention, I make use of a trough or vessel containing the emulsion, and also of a metal roller working in bearings and made to revolve in the trough which contains the emulsion with which the plates are to be coated.

The length of the roller and trough must be slightly greater than the width of the largest plate to be coated, and I fix the said roller and trough above and across a travelling band or table which carries a continuous train of plates to be coated. In order to carry out my improved method of applying an even coating of emulsion to the surface of the plates, I make a scraper, preferably of sheet metal or ebonite, of suitable length and thickness, and I fix this scraper parallel to the roller so as to turn on pins or centres at, or near, the lower edge, and by means of a lever, weight, or springs, the upper edge of the scraper is made to press against the roller which revolves in the trough, and I make the scraper of a convenient shape and width, and fix it at any suitable angle so that the lower edge rests upon, or nearly in contact with, the surface of the plates or paper to be coated.

When the roller is made to revolve in the emulsion the solution which adheres to the surface of the roller is taken off by the upper edge of the scraper towards which the roller revolves; the emulsion then flows down the scraper to the surface of the plates which are carried by the travelling band below; by this means the plates are coated with an even layer of emulsion, the thickness of the coating being regulated by the relative speeds of the roller and the travelling band which carries the plates. In order to coat plates of various sizes I make the above-described scraper removable, and, when required, I replace it by another similar scraper of the length required to correspond with the width of the plates to be coated. In order to admit of coating plates of different degrees of thickness, I make the centres or pins at the lower edge of the scraper to work in bearings fixed to a movable frame or pair of side rods pivoted or hinged at one end, and carrying at the other end a roller or guide which rests upon the surface of the plates as they pass beneath the scraper; by this means the frame or rods carrying the scraper rises and falls in proportion to the thickness of the plates, which are thus allowed to pass under the scraper without obstruction; sometimes I attach the scraper to the side of the trough, and support the trough itself with the scraper attached by means of pivots or bearings upon the movable frame, or side rods before described. In order to facilitate the cooling or setting of the emulsion after it has been spread upon the surface of the plates, I cause the travelling band carrying the plates to pass over a table or slab artificially cooled by being kept partially immersed in ice-water or other cooling substance contained in a metal tray within which the slab rests, and I cover the table or slab with a metal tank containing ice or other cooling substance; the tank is supported so that the under side is only a short distance above the slab, thus forming of the space between the slab and the under side of the tank or cover a cooling chamber or tunnel, through which the plates pass. The cover or tank also serves to protect the plates from light and dust after they have been coated with emulsion; by the above-described means the the emulsion is rapidly set, and the plates are very quickly ready to be removed from the travelling band and placed in racks to dry.

In practice I prefer to make the travelling band in two separate portions of unequal length; that is, I make two endless bands to travel in the same direction. One of these bands, which I call the coating band, is used only to carry the plates under the trough and scraper; the plates then pass on to the other band, which I call the setting band, and which carries the plates over the cold slab and through the cooling chamber before described. Each of the above-mentioned bands works over a pair of rollers or drums fitted at one end with a driving-pulley, by means of which the band is made to travel in the required direction, the setting or cooling band being made to travel at a slightly greater speed than the coating band, in order to cause the plates to separate from each other as they pass into the cooling chamber.

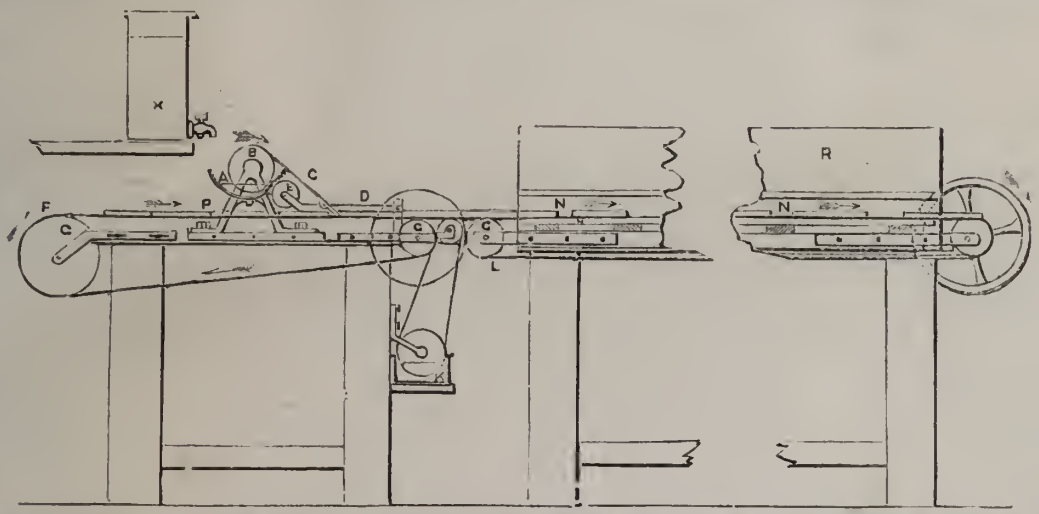
For the purpose of cleaning the back or under surface of the plates, and removing any emulsion which may have been spilled on to the coating band, I make another endless band of rubber cloth passing over a pair of rollers of suitable diameter, and I fix one of these rollers so that the cleaning band just touches the coating band and the under side of the plates after they are coated, and I arrange the other roller, which is driven by a pulley,

so that it revolves in and carries the endless band through a trough of warm water; by this means the back or under surface of the plates is cleaned, and the travelling bands which carry the plates are kept clean and free from emulsion.

For coating paper with gelatine emulsion for photographic purposes I use my improved machinery and apparatus substantially as above described, and in a similar manner, with the exception that I dispense with the cleaning band and one of the rollers, and I use the other roller and the trough for the purpose of wetting or damping the paper previous to its being coated, and I use another roller or squeegee for the purpose of removing the excess of moisture and causing the paper to adhere to the coating band before being passed under the trough and scraper; the paper when coated passes through the cooling chamber, after which it is cut into convenient lengths and hung up to dry. In this manner a continuous length of paper can be uniformly coated with a layer of gelatine emulsion of any desired thickness. In using my improved machinery for coating plates or paper I actuate the rollers and bands by means of pulleys of suitable diameters to give the speed required, and driven by a gas engine or other suitable motor.

The endless bands may be made of india-rubber cloth or other suitable flexible material; but I prefer to make the band which passes through the cooling chamber of woven wire or thin metal plate, in order to cool or set the emulsion as rapidly as possible. Sometimes instead of ice, as above described, I use a current of cold air or vapour for the purpose of setting the emulsion on the plates or paper in the cooling chamber; in any case, this chamber or tunnel must be of sufficient length to allow of the film of emulsion being perfectly set or stiffened before the removal of the plates or paper from the band; the length required will depend greatly on the speed at which the machinery is driven. With a moderate speed I find fifteen feet a convenient length for the refrigerating chamber or tunnel. By means of my improved machinery and appliances as above described, photographic plates or paper may be prepared or coated with gelatine or other sensitive emulsion with greater rapidity, certainty, and uniformity than has hitherto been practicable by any other method.

The accompanying drawings show the various parts of my improved machinery as described in the above specification. I do not, however, confine myself to the precise details of con-



A is the trough containing the emulsion; B is the roller; C is the moveable and adjustable scraper; D is the pivoted frame which carries the scraper and sometimes the trough; E is the grinding roller; F F is the travelling band for coating; G G G are rollers carrying the travelling bands; H H are similar rollers to carry the endless band for cleaning the plates; J is the cleaning band; K is the trough containing water for cleaning or washing the band; L L is the travelling band carrying the plates through the cooling chamber; M is the cooling chamber or tunnel closed at the sides and open at each end; N is the cold slab over which the travelling band passes; O is the metal tray in which the slab rests; P P are the plates, before and after being coated; R is the metal tank or cover over the cooling chamber; S is the spring which presses the scraper against the roller; X is a reservoir of emulsion for replenishing the trough.

struction as shown or described, as the same may be somewhat modified without departing from the principle of my invention.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I wish it to be understood that I do not claim any novelty in the use of a roller revolving in a trough of emulsion as heretofore used for applying a coating of emulsion to photographic plates and for other purposes, nor do I claim the use of an endless band for carrying the plates as described in Swan's Specification, A.D 1879, No. 4607; but I claim as my invention—

Firstly. The movable and adjustable scraper or scrapers of any suitable shape or size, in combination, with the roller and trough for the purpose of applying the coating of gelatine or other emulsion to the upper surface of the plates as described.

Secondly. The cooling chamber or artificially cooled table or slab, in combination with the endless band carrying the plates, in order to facilitate the setting or cooling of the gelatine emulsion after it has been applied to the surface of the plates or paper by means of the roller and scraper or by any other method.

Thirdly. I claim the endless band as above described for cleaning the back or under surface of the plates after they have been coated. I also claim the arrangement of the pivoted frame or rods which carry or support the scraper, and sometimes the trough together with the roller or guide in order to allow of the use of plates of various degrees of thickness.

Correspondence.

THE POTASH DEVELOPER.

Dear Sir,—Having lately been compelled to abandon the use of pyro and ammonia for considerations of health, I was at a loss to know what developer I should adopt in its place. Ferrous oxalate I had tried, and discarded; while what little experience I had of soda was not in its favour. A few days ago I was advised to try a potash developer made according to the formula given in the Photographic News for August 1st, page 485. I made it up exactly as there given; but as the dose of pyro recommended for developing one plate seemed excessive, I halved it, and with satisfactory results.

My first experiments were made on four of Swan's plates, which I had had in stock for about three years. They had been kept in a tin trunk in the kitchen, and consequently the films were very hard and dry, and repellent to the developer. The exposure was made by means of a Lancaster instantaneous shutter, which, as a more severe test, was used on subjects both in shade and in sunshine.

On applying the developer, each plate, after a few seconds, began to reveal the image, which steadily

increased in intensity, being at the same time full of detail. In five minutes development was complete. The negatives, after fixing, were clear and brilliant, without a trace of fog or stain, although no alum was used after development. Their printing qualities are excellent.

I have since used this developer with other makes of plates, some of which I had in stock, and some given me by friends for trial, and all have turned out equally well. It is true that the plates of one maker frilled most horribly after coming out of the hypo, unless dosed with chrome alum after development; but whether this was the fault of the plates or of the developer, I don't know.

The potash developer appears to me to present the following advantages:—1st. Freedom from noxious fumes; 2nd. Cleanliness—it does not stain the fingers or the plates; 3rd. It is completely under control; 4th. No bromide or other restrainer is required; 5th. It gives clear, brilliant, quick-printing negatives; 6th. It is far more powerful than the ordinary pyro and ammonia developer, hence far more suitable for instantaneous work and for photo-micrography. No forcing of the image is necessary: and the details in the shadows of an instantaneous picture come out with due strength.—I am, sir, yours faithfully,

J. H. Jennings.

THE KEEPING OF GELATINE PLATES.

Sir,—Mr. T. G. Whaite tells us in your last issue that he has kept gelatine plates for three and a-half years, and adds that he believes they will keep indefinitely, if well-packed and kept dry. As an amateur, I always use plates of my own make, and put by for experimental purposes any faulty ones out of a batch. A few weeks ago I alighted upon half-a-dozen which had been stowed away in a cupboard and forgotten all about. Now, this said cupboard, in the basement of my house, is the dampest place I have ever seen in any house, and totally unfit for any domestic use, and when I discovered these plates wrapped in a couple of sheets of brown paper, and then loosely in American cloth, I intended to throw them away, as they had been lying there for at least a year and a half: but before doing so, I tried an experiment, when lo, behold! the image came up with as much brilliancy as if the plate had just been taken out of a packet fresh from the manufacturer. I simply record this fact to prove that dampness cannot affect the gelatine plate so much as is generally supposed.—I am, yours truly, W. H. Plaister.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 14th inst., Mr. C. P. Salmon in the chair.

Mr. J. B. B. Wellington called attention to a recent communication in one of the journals respecting the restraining power of gallic acid when employed in conjunction with alkaline pyro development. Two plates were shown, one of which had received an exposure of three seconds, and the other forty seconds; the former was developed as follows:—

Pyro.	3 grains
Potassium bromide	3 ,,
Liquor ammonia...	3 minims
Water	2 ounces

The latter was similarly treated, but two grains of gallic acid were added to restrain the developer. There appeared to be very little difference in the resulting negatives, showing the restraining power of gallic acid to be very great.

Mr. A. Haddon also showed two prints from negatives which had been much over-exposed; finding the first plate over-done with the normal developer, he added a few drops of a sixty-grain alcoholic solution of gallic acid, which entirely corrected the excessive exposure in the second plate; both plates were exposed the same length of time, the stop being $\frac{f}{128}$ universal system.

Mr. W. Cole suggested glycerine as a solvent for gallic acid, which would likewise preserve it from decomposition. His opinion was favourable to the use of soluble bromide, which had precisely the same effect.

Mr. Haddon said that gallic acid was a far more powerful restrainer than a soluble bromide.

Mr. W. M. Ashman enquired whether any abnormal difficulties had been experienced in the treatment of gelatine plates during the recent high temperature?

The Chairman had found the rapidity was much increased.

Mr. Ashman mentioned a case in which the films dissolved in the developing solution, necessitating the employment of ice in the development of several others; he also said he had met with a difficulty in varnishing, part of the film dissolving, and having an effect similar to negatives which have been heated to accelerate drying.

Mr. A. Cowan thought the plates first spoken of contained no chrome-alum in their composition, and in the second case the varnish contained more water than it should do.

Mr. W. E. Debenham said probably the heat experienced during the last few days would cause alcohol to escape from the varnish, thus leaving a larger proportion of water, without precipitating the gum.

The Chairman then announced the presence of a distinguished visitor, Mr. Derham, of Boston, Massachusetts, and after extending him a hearty welcome, invited him to say a few words on American photography.

Mr. Derham said he was pleased to be present; he read the reports of these meetings with great interest, and thought if the English were slow, they understood the way to make quick plates. He then passed round some examples of the style of work made in Boston on gelatine plates. He thought the best results were obtained on slow plates, and preferred the method of precipitating a given quantity of silver and bromide, gaining sensitiveness afterwards by boiling, and adding a small quantity of ammonia and free bromide to the finished emulsion; this latter had to be determined by experiment, for if more than a given quantity either of ammonia or bromide be added, it had the effect of slowing the emulsion. The developer he preferred was as follows:—

No. 1.	
Water	5 ounces
*Lactic acid	2½ drachms
Bromide of potassium	60 grains
Pyrogallol	240 ,,
No. 2.	
Water	4 ounces
Sodium sulphite	360 grains
Dissolve, and add—	
Bromide of potassium	180 grains
Liq. ammonia ·880	5 drachms

Use one part each of Nos. 1 and 2 in twenty parts of water, or the proportion may be varied to suit the subject. Lactic acid appears to act as an accelerator.

Mr. W. E. Debenham said he was much pleased with the appearance of the prints, and wished to learn the details of their production.

Mr. Derham stated that the paper was floated, according to temperature, from half to three minutes on a 50 to 60-grain bath, fumed, well washed, and placed in salt and water before toning in the borax and gold bath. The vignetting was performed by means of a block of wood an inch and a-half in thickness, and bevelled inwards from the centre.

Mr. Debenham suggested the idea of having a series of transparencies made from a negative to be selected, and the results to be shown in the lantern at one of the winter meetings; he thought it desirable to choose a portrait, landscape, and seascape subject, and prevail on any member who was *au fait* at a particular process to produce a positive by his process, then pass the negative to another member. They would thus have a means of comparing the values of the different processes for enlarging or lantern work.

Amateur Photographic Association of Victoria.

Although New Zealand has been credited with having beaten Australia in the formation of an Amateur Society, it appears that such is not the case, as the above Association was formed on the

* An impure commercial article, manufactured, probably, to supply the place of acetic acid. It is used in Boston in the composition of iron developers and other photographic preparations.

18th of June, 1883, and is consequently a few months older than the New Zealand Society.

The Victorian Association has been doing useful work during the thirteen months of its existence, practical demonstrations of the methods of working the principal photographic processes having been given from time to time, including the manufacture of gelatine emulsion and plates, development of gelatine plates, enlarging on argentic bromide paper, enamelling, &c., and exhibitions of transparencies in the lantern, together with papers on various subjects.

The first anniversary was celebrated by an Exhibition, which was held on 23rd June last. This is worthy of note, having been the first purely photographic exhibition ever held in Australia; and it is something to the credit of an amateur society that it was a success in every sense of the word.

The commodious rooms of the Royal Society of Victoria were placed at the disposal of the Association, and the walls hung with photographic work of all kinds, tables round the rooms being utilised for the purpose of exhibiting apparatus, of which there was a magnificent collection. The rooms were crowded with visitors, there having been many more than the promoters of the Exhibition had expected.

The proceedings were opened by an address from the President, Dr. Browning, followed by an interesting paper on the "Rise and Progress of Photography," which was read by Mr. Ludovico Hart, who is well-known in European photographic circles (this gentleman was formerly manager of the photo-mechanical printing department of the Government of New South Wales, and Lecturer on Photography at the Technical College, Sydney), and the proceedings wound up with an exhibition of transparencies.

The great majority of the exhibits were from members of the Association, but there were several from a few of the leading professional photographers of the city. A great deal of the apparatus shown was also the work and invention of members, and the whole of the transparencies were amateur work.

The Association meet at the Royal Society's Hall monthly, the last monthly meeting having been held on Monday, 7th July, on which occasion the subject of the manufacture of gelatino-bromide and gelatino-chloride plates was practically demonstrated by one of the members (Mr. Musgrove) who has been very successful in making his own plates. He went through the whole of the processes, from the cleaning of the glass to the forming, washing, &c, of the emulsion, finishing with the coating and packing of plates, the whole details being plainly put before members, many of whom, who had not tried the making of their own plates, determined to make a trial after his explanation.

After a few questions had been asked, the meeting closed with a vote of thanks to Mr. Musgrove.

St. Helen's Association of Science, Literature, and Art.

Photographic Section.

The annual meeting of this Section was held at the Association Rooms on Wednesday, the 9th ult., Mr. Heather in the chair. The minutes of the previous meeting having been read and confirmed, the Hon. Sec. read the annual report, from which it appeared that the Photographic Section entered upon the second year of its existence this month. Eight new members had been added to the list since its formation, whilst on the other hand four had resigned.

Up to the present, Mr. Heather had been relied upon for demonstrations, of which the following had been brought before the members:—"Enlarging on Hutinet's Gelatino-Bromide Paper" (twice); "Preparation of Gelatino-bromide Emulsion"; "Preparation of Lantern Slides"; "Reduction of Negatives." One evening was devoted to photography by artificial light, and was fairly successful.

The Section took part in contributing to the interest of the Conversazione on January 24th, a large collection of photographs were shown, and Messrs. Heather, Morton, Taylor, and J. Houghton were busily engaged photographing the visitors by the collodion method on ferrotype plates.

A well-attended out-door meeting had been held at Knowsley, and a number of interesting exhibits of apparatus, lantern slides, prints, &c., had from time to time been made.

The Hon. Treasurer's statement was then laid before the meeting, showing a balance in favour of the Section of £1 13s. 10d.

The following officers were elected:—

Chairman—Mr. Heather. *Hon. Treasurer*—Mr. Crooks.
Hon. Secretary—Mr. J. F. Houghton.
Auditors—Messrs. Bewley and Loader.
Committee—Messrs. Brook (ex-officer), Morton, Sherlock, J. Houghton, Taylor, and Bewley.

It was resolved that a 15 by 12 burnisher be purchased for the use of members.

Mr. Taylor said a few days ago he was making a tranparency, and, believing the emulsion to be a slow one, gave a prolonged exposure. When taken out of the frame in the dark-room, he was astonished to find a positive picture on the plate; he fixed at once and got a negative from a negative.

Mr. Brook showed a number of very fine views, taken near Leek, North Stafford.

Mr. Heather also showed a number taken at Wenwick.

The meeting shortly afterwards closed.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday next, August 26th, at the Gallery, 5a, Pall Mall, East; the chair will be taken at 8 p.m.

By command, Messrs. Downey, of Ebury Street, Eaton Square, attended at Osborne on Saturday last, and took photographs of the Queen in the act of presenting new colours to the Seaforth Highlanders. On Friday and Saturday the same artists photographed the Prince and Princess of Wales and their family on board the *Osborne*.

Balloon Photography.—Mr. Cecil V. Shadbolt furnishes us with the following interesting particulars of an "aëronaut's holiday" which he and Mr. Dale celebrated on Wednesday last, 13th inst.:—"At noon precisely we made a special private ascent from the Crystal Palace grounds in our new and lovely little balloon, the *Monarch*. Photography of course played an important part in the exploit, and, I am glad to report, with most successful results. At length, I think I have quite equalled, if not surpassed, my achievement of 1882. We made a rapid rise so as to avoid some trees, and shot up pretty quickly to an elevation of 5,200 feet. Here, finding the clouds were closing in rapidly underneath, and obscuring the charming panorama which lay below, we opened the valve and lowered the balloon somewhat. For a few minutes we were completely lost in the clouds, and could see nothing but mist all around us. We then came down very low, and crossed the Thames and the Royal Albert Docks at an altitude of 600 feet only, our shadow being distinctly visible on the surface of the water as we glided past. Some time after this we were somewhat astonished, after rising again, to fall in with a stray dandelion or thistle fluff which was sailing along 1,400 feet above the earth. The descent was safely effected in a field at Doddinghurst, some four miles from Brentwood, in Essex, and I am pleased to say that I was successful in securing several satisfactory photographic momentoes of the trip."

Death of Mr. Jabez Hughes.—We extract the following from *The Isle of Wight Observer*:—"We deeply regret to record the death of Mr. Jabez Hughes, the well-known photographer of Regina House, Union Street. Mr. Hughes had been in failing health for some time, suffering from a complication of diseases. He left Ryde for change of air and scene a few weeks ago, but soon had to return home in consequence of extreme weakness. We understand that he kept his bed about a week, finally succumbing on Monday morning. Mr. Jabez Hughes was one of the earliest and most successful students of the beautiful art of photography, which he aided to improve and develop. It is many years since he succeeded to Mr. Lacey's business in the Arcade, and rapidly attained a leading position in the photographic world, which is proved by the fact that he has been constantly employed by Her Majesty the Queen, and has exercised his skill in pourtraying, not merely Her Majesty, but every member of the Royal Family. He has also taken the photographs of many of the leading men of the day. The late Lord Beaconsfield had a notorious dislike to facing the camera, but, at the Queen's command, when his lordship returned with 'peace with honour' from Berlin, he was taken at Osborne by Mr. Hughes, who secured the only really reliable portrait of this remarkable statesman. Our space is too limited to enable us to give a catalogue of all the distinguished men and women whose

features Mr. Hughes has preserved for posterity. Not merely are Mr. Hughes' photographs like, as far as regards resemblance to the features of their originals, but he had a happy power of seeing the best aspect of a face. Mr. Jabez Hughes' skill was fully recognized by his brethren of the camera, and he belonged to more than one photographic society, the members of which did him the honour of making him their president. As a townsman Mr. Hughes was much liked and universally respected, but he refused to have anything to do with local politics."

A Daily Newspaper on Photography.—The *Daily Chronicle* of yesterday has the following:—"*Improvements in Photography.*—Last night a meeting of the members of the Photographic Club was held at Anderton's Hotel for the purpose of discussing recent discoveries in photographic art. Mr. Dallas presided, and in opening said they had met to consider how far the art could be advanced by the recent discoveries of photographic printing through the means of coloured media. Under the system of printing through plain white glass negatives, they had to guard against many difficulties. He then called on various members to address the meeting. A number of gentlemen gave their experience, and showed certain well-executed, delicate specimens of out-door photography, which were printed through coloured media, chiefly fine tissue paper of various tints, which being placed over the negative guarded against photographs being made too dark, by the strong and sudden action of the light in the printing. Mr. Cowan exhibited some fine views of Chingford. Mr. Wellington next exhibited a new dark slide box for out-door work, which was rendered exceedingly light and effective for the dry-plate process by means of a number of dark slides being formed with ready adaptation, by means of divisions composed of vulcanized ebonite, and which he had patented during the week. Mr. Duumore exhibited specimens of printing through coloured media at Hampstead. Mr. Hale exhibited a newly-constructed camera, the advantages of which were great lightness and ready adaptation for single or stereoscopic views. It was arranged that a meeting for experiments in printing by coloured media should take place between Highgate and Hampstead on Saturday next. By "the recent discoveries of photographic printing through the means of coloured media" is, we imagine, meant the practice of shading the printing frame during exposure when a weak negative is to be dealt with; and it has been suggested that coloured tissue paper is better for the purpose than white.

Photographic Club.—At the meeting on August 27th, the subject for discussion will be "The Artistic Monthly of Photographs." Saturday afternoon outing between Highgate and Hampstead; meeting afterwards at the "Bull and Bush" at 6·30.

To Correspondents.

*** We cannot undertake to return rejected communications.

L. N. C.—Simply use the tissue coating machine described on page 453.

K. Lloyd.—1. Develop ordinary carbon prints on flexible support, and transfer them as directed on page 332. 2. Not quite up to the mark.

Transfer.—It seems to us that the bath is out of order. Make it slightly alkaline with sodium carbonate, and expose it to the full sunlight for some days. Then filter it, and make it very slightly acid with nitric acid.

J. W. Robinson, Jun.—Such information, arranged in tabular form, would doubtless be useful, and the matter shall be considered.

T. Vodden.—It will not dissolve, because it has been vulcanized: obtain some of the so-called masticated rubber.

Errata.—The reader is requested to make the following corrections:—Page 506, column 2, 32nd line from bottom, for —*Blinds*, read , *which*. Same page and column, 20th line from bottom, for *imperfect*, read *are perfect*. Same page and column, 10th line from bottom, insert comma after lens. Page 507, column 1, 33rd line from bottom, for *as*, read *on*. Same page and column, 22nd line from bottom, for *wood*, read *hood*.

Bellagio.—1. You had better state distinctly in your order that the lantern must admit a plate 8½ inches high, or you will probably receive one which will be useless for the purpose. 2. Either will do, but the former is to be preferred as being of shorter focus. 3. You will do best to order it from the house with which you are in the habit of doing business, as we think there is only one *actual* maker in London, and you are tolerably sure to get his, whoever supplies it.

Out of Focus.—

Silver nitrate	...	...	...	950 grains
Sodium chloride	...	...	...	480 ,,
Heinrich's gelatine	...	...	...	960 ,,
Distilled water	...	...	...	30 ounces

Dissolve silver in 10 ounces of the water, and the chloride with half the gelatine in 15 ounces of the water, and allow the remaining gelatine to swell in the 5 ounces of water standing over. Bring all vessels to 120° F., and when the gelatine is melted, add the silver solution to the plain gelatine, and then emulsify gradually with the gelatine solution containing the salt. Allow to set, and wash in the usual way.

G. N.—It seems to us that they are iron stains; in fact, we are tolerably sure about it, and the remedy is, to be more careful in not using water containing the settlings of the cistern.

Henry Spink.—An ordinary blacklead pencil answers admirably.

Pin.—1. In order to get a good cast in type metal from the plaster mould, it is necessary that this mould should be quite dry and hot. In addition to this, the melted metal should remain in contact with the plaster for a considerable time. If you work in the following manner you will probably succeed. Lay the well-dried and hot mould, face downwards, in an iron dish, about two inches deep, but by means of a couple of strips of iron, a quarter of an inch square, keep the face at this distance from the bottom of the box. Now put a heavy mass of iron on the back of the plaster mould, so as to prevent it from floating up when the metal is poured in, and heat the whole apparatus over a gas burner until it is at about the melting point of type metal. The melted metal is now poured in, taking care to avoid all scum or dross, until the iron dish is full, and the heat is maintained for a quarter of an hour, after which the whole is allowed to cool. The stereotype must be cut out of the mass of metal by means of a saw. 2. A diapositive may be made by exposing an ordinary gelatino-bromide plate under a negative (a few seconds to the light of a gas flame) and developing as for a negative. 3. We do not know, but are inclined to think that they are done by the former method. 4. Because the light in passing through the transparent parts renders the gelatine insoluble. 5. Yes. 6. Quite as good, but perhaps rather more trouble. 7. Make a transfer by the Ives method.

Electro.—The surface must be very carefully covered with the finest plumbago, or the work is very uncertain. 2. It is possible, but very difficult, as a continual swelling takes place in the bath. 3. It is as you say, and it is not likely that anyone was misled.

One in the West.—It is owing to some feature in the manufacture which we cannot determine: try fuming it with ammonia in the first place, and if that does not answer, obtain a fresh sample.

The Photographic News Registry.

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Assis. (lady), tint, spot, &c.—G. L., 5, Heaton-villas, Heaton-rd., Peckham.
Oper. & Retouch, good all-round.—Operator, 162, Bristol-st., Birmingham.
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Recep.-room or General Assist.—K. L., 73, Ravenhurst-rd., Birmingham.
Retoucher or Operator.—Artist, 13, Fountain's rd., Hull.
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Photo. Artist (lady).—Miss Hebbert, 45, Chesterton-rd., Notting-hill.
Assistant Operator or Printer.—E. W., 77, Sutherland-st., Pimlico.

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Retoucher, Lady or Gentleman.—F. Guy, Manchester Hall, London.
Operator (Photo-etching).—P. N., c/o C. Tayler, 154, Fleet-st., E.C.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1356.—*August* 29, 1884.

CONTENTS.

PHOTOGRAPHS OF THE SUN.

SUN-SPOTS have been connected by popular imagination with very many terrestrial phenomena, and the fact is that but little is known about the actual nature of sun-spots; but there can be no doubt whatever that one of the first means of learning is to map out and record the constant variations which take place.

Dr. Lohse, of Potsdam, is now engaged in making photographic records of the appearance of the sun's disc, and each picture taken adds greatly to the value of the series, as it is only by a study of the variations of the spots that we may hope to be able to discover the conditions under which they arise. The opportunity of obtaining a really good photograph of the solar disc does not occur very frequently, so that the production of such a series as may give the means of drawing important conclusions may be the work of many years.

The picture which forms our supplement this week was produced by Dr. Lohse under exceptionally favourable atmospheric conditions, and he gives us the following particulars:—

"The photograph of the sun was taken with the heliograph of the Astro-Physical Observatory at Potsdam, on the 13th of October, 1883, at 2.43 p.m., Berlin mean solar time, when the atmosphere was unusually clear and undisturbed. The instrument is provided with a Steinheil objective having an aperture of 160 millimeters, and a focal length of 4,000 millimeters. It is set in a fixed position, while the moving heliostat serves to keep the beam of sunlight steadily on the objective of the telescope. The reflector of the heliostat consists of a glass plane silvered on the face, and as the axis of the heliograph is parallel to that of the earth, a heliostat of comparatively simple construction serves.

"The negative of the photograph now published was taken on a gelatino-bromide dry plate, and the exposure is estimated at one two-thousandth of a second. The line which crosses the disc is merely the image of the spider thread which crosses the field horizontally in the focus of the lens; the horizontal position of this thread being carefully adjusted by a level.

"The heliograph of the Potsdam Observatory has been in use since 1881, and during the period which has elapsed since its erection, more than 600 solar photographs of the size of that now published have been taken; and, besides these, some larger pictures (300 millimeters in diameter) have been produced, which show, in an exceptionally satisfactory manner, the fine details of the solar surface."

THE SWING-BACK AND THE RISING-FRONT.

A NOTE which we recently had from a correspondent has put us in mind of the difficulties which beginners frequently find in the use of that important adjunct to the modern camera, namely the swing-back.

That some confusion should exist in this matter is by no means unnatural, seeing that the swing-back of a photographic camera may be used for two objects entirely distinct and different, and that moreover their uses are closely connected with that of another movable part, the rising-front.

The two objects for which the swing-back is used are, first, the securing of definition in the negative, if placed at different distances from the camera; and second, the securing of parallelism in a negative such lines as may be vertical in the subject and may be placed considerably above or below the point of view of the photographer. The swing-back is frequently used for the latter purpose when the rising-front might be used with better advantage.

Taking, first, the case where we wish to bring places at different distances from the camera into focus at the same time, we shall imagine the simplest possible subject.

We wish to photograph a landscape in which the nearest objects will form the lower portion of the picture, somewhat more distant objects the centre portion, and what are usually somewhat indefinitely termed "distant" objects the upper portion. When we place our camera opposite such a landscape we will of course find the order of the objects reversed; that is to say, the foreground will be at the top of the ground glass, and so forth. We are also well aware that unless we are using a lens of short focus and small aperture, some of these objects will be rendered with imperfect definition. We may focus accurately for either the foreground, the middle distance, or the distance. For whichever one we focus, the other will be out of definition. The most natural course is the focus for the middle distance, and afterwards to bring the other two portions of our picture into sufficient definition by the introduction of a small stop. If, however, we have a swing-back attachment to our camera, we need not do this. The nearer objects will focus further from the lens than the more distant. The nearer objects have their representation at the top of the ground glass, therefore if we increase the distance from the top of the ground glass to the lens, we will improve matters. This we do by swinging the back of the camera away from the lens. There is no means of discovering the precise amount of swing required, except that of trial and errors. We clamp our back in a certain position, and focus a second time. If we are not pleased, we try a greater or less angle.

The very same operation may be gone through with advantage in portraiture, especially when the position of the subject is a sitting one. So far the matter is quite simple, and this means of bringing different planes into focus may be used whenever there are no vertical lines in the subject. We adjust our swing-back as described, and, to bring the correct amount of foreground, sky, &c.,

into our picture, either tip the camera, or raise or lower the front. It is best to tip the camera to a moderate degree, and, if still more adjustment be required, to raise or lower the movable front and lens till we have what we require.

The matter assumes a very different aspect, however, when we come to apply ourselves to the photographing of objects with vertical lines, especially buildings. We shall suppose that our object is to make a representation of the most ordinary possible house, that our point of view is level with the ground floor, and that we cannot get very far away from the building.

If we adjust our camera so that it is level, and look on the ground glass, we shall see that about half of it is filled up with the street, and that we have not nearly got in the top of the house We can put everything right so far as these two matters are concerned by simply tipping up the camera, but by so doing we at once introduce a third defect: the vertical lines of the house will all be found to converge considerably towards the bottom of the ground glass—that is to say, towards the top of the picture, in which latter, were the negative taken with the camera tipped up as described, the buildings would have the appearance of a truncated pyramid, or of leaning backwards.

Without entering at length into the cause of this peculiar effect, we may say that, without regard to the direction of the axis of the lens, so long as the ground glass of the camera is vertical, the vertical lines of the subject will come out parallel; so long as the ground glass of the camera leans away from the building, the lines will converge towards the top of the picture; so long as it leans forward, towards the top.

Now it is evident that if we have our camera tipped, and merely swing the back forward so as to be vertical, we shall get an undistorted image. But let us see what we have done with regard to the definition of our foreground and the house. The foreground in this particular example is likely to be the area railings. Still, it is nearer the camera than the plane forming the front of the house. To secure the best results as regards definition, we should therefore have to swing the back so as to have the top of the ground glass further from the lens than the bottom—that is to say, we should have done the precise opposite of what we have done. In fact, we have so used our swing-back that the definition of one part or another of the image must be particularly bad, and we have to use a very small stop to correct this. Frequently the smallest stop with which a lens is provided will be too large to completely counteract what we have done.

Another course was open to us instead of using the swing-back. We might have placed the camera horizontal, so that the ground glass would be vertical, without the use of the swing-back, and after that we might have raised the lens by means of the rising-front. We should thus have secured our object had the lens been capable of covering a large enough field. We should also have secured, on the whole, much better definition than when using the ground glass. It is quite possible, however, that when we had raised the lens, we might have found that the lower corners of the ground glass were quite dark—that the mount of the lens had cut off the oblique pencils of light reflected from the top of the building, and that, as a consequence, our picture was curtailed. In this case we can, of course, only resort to the use of the swing-back. We may state this, however, as a rule which will be found to hold very generally good: if the lens will permit of it without the picture being curtailed, it is better, for securing parallel lines from vertical objects, to use the rising-front, and leave the camera horizontal, than to tip the camera and use the swing-back.

It must not, however, be supposed that by using the rising-front we shall get as good definition as when we can point the camera direct at the object to be photographed, and can leave the swing-back in its normal position with the ground glass perpendicular to the axis of the lens. Whenever we use the rising-front, we make use of those parts of the combination of a lens which give the worst definition; that is to say, those parts farthest from the centre. Pencils going to form the image pass through the lens at greater angles with its axis than they otherwise would.

From what we have said the following may be deduced: the swing-back should never be used for securing parallelisms of lines when the rising-front may be used. Neither the one nor the other should be used (for the purpose mentioned) when it is possible to do without them.

Of course it is possible to use both the swing-back and rising-front at the same time: that is to say, to make part of the correction by the use of the one part by the use of the other. To what extent each should be used in such a case can only be ascertained by practice and experience.

We have spoken so far only of the vertical swing. The horizontal or side swing is only used to secure the first of the two objects mentioned, to bring planes at different distances from the camera into focus at the same time. It may be used when the objects at one side of the picture are much nearer the camera than those at the other. Of course it may be used in such cameras as are provided with it at the same time as the vertical swing. In any case, it will introduce no disturbance as far as the parallel rendering of vertical lines is concerned.

NOTES FROM NEW YORK.

A Resume of the Late Photographic Convention. Some Interesting Exhibits.

The fifth annual Convention of the Photographers' Association of America was held at Cincinnati, Ohio, between July 29th and August 1st, and proved to be more successful in exhibits and attendance than any previous Convention.

On the 29th, the Convention was called to order by the President, Mr. J. H. Kent. An address of welcome was delivered by Mr. Weingartner, and a paper, "The Progress of Photography," was read by C. Gentilé, of Chicago. The President also made an address, in which he discussed the question of cheap *v.* high-priced pictures, advising all to keep up the high quality of their work, and charge corresponding prices. There was some further discussion in regard to the business before the Convention, after which it adjourned.

The day of the 30th was occupied in discussing the question of prices to be charged for photographs, and also the discussion and voting on changes in the constitution and bye-laws. Mr. Ryder, of Cleveland, Ohio, read a paper "On the Business Management of Photography," bringing out many pungent hits, which elicited much applause.

The Committee appointed to award prizes offered for the best negatives on dry plates by three different manufactories rendered their report.

The first prize of $300 for best work on a 11 by 14 instantaneous larger Cramer plate was given to F. W. Guerin, St. Louis, Mo.

The first prize of $200 for best collection of cabinets and other sizes below 11 by 14 on Cramer plates was given to J. E. Hall, Seneca Falls, N.Y.

The first prize of $100 for best collection of views on the same plate was awarded to J. Landy, Cincinnati, O.

By the direction of the Committee, six $100 were awarded by the St. Louis Dry Plate Company for the best display of photographs on their plates to W. H. Potter, Indianapolis, Ind.; D. K. Clark, Indianapolis, Ind.; W. F. Guerin, St. Louis, Mo.; Strauss Bros., St. Louis, Mo.; C. W. Motze, Atlanta, Ga.; T. H. Doerr, Louisville, Ky.

Awards on the James's Inglis Dry Plates were as follows:—First prize of $100 on 11 by 14 plates to Mr. Cook Ely, of Oshkosh, Wis.; second prize of $100 on cabinets to Mr. Elton, of Palmyra, N. Y.; and also J. M. Brainer, of Rome, N. Y.

More than 150 separate exhibits of photographs, from every section of the country, were shown, and the general opinion prevailed that it was an improvement on former work, and illustrated the steady advance of dry plate photographs.

Among the distinguished persons on the platform was Mr. A. L. Henderson, of London, representing the London and Provincial Photographic Association. He was received with much applause, and responded with a few appropriate remarks.

The day of the 31st was taken up with the discussion on the subject of the reduction of postage rates on photographs, and a resolution was passed requesting the Postmaster General to restore the old rates. Resolutions of thanks were also passed, and ordered to be sent, to E. A. Burke, Director of the World's Exposition at New Orleans, La., in response to his invitation to the Nat. Association of Photographers to attend.

The election of new officers for the coming year then took place, resulting as follows:—

President.—James Landy, of Cincinnati, O.

Permanent Secretary.—Leo. Weingartner, of Cincinnati, O.

Treasurer.—G. M. Carlisle, of Providence, R. I.

Executive Committee.—Joshua Smith, Chicago, Ill., and W. A. Armstrong, Milwaukee, Wisconsin. Buffalo, N. Y., was the next place fixed upon to hold the Convention of 1885. The Convention then adjourned *sine die*.

The exhibit made by W. A. Armstrong, of Milwaukee, was very artistic. Some fine specimens in statuesque photography were shown by C. W. Motze, of Atlanta. Backgrounds and studio accessories were in immense variety, displaying to full advantage the artistic talent of Seavy, who was closely pressed by Spurgin, of St. Louis, Mo.

Among the curiosities of photographic apparatus was a novel photographic printing machine for automatically printing photographs. It resembled a clock, and was set in motion by clockwork within, which was regulated in such a way as to allow the sensitive paper to be held in contact behind the negative for a specified number of minutes, just as long as the operator set it for; and he is notified of the completion of a batch of one, two, three, or four dozen prints, by the automatic sounding of an alarm bell. There is also an attachment for varying the length of exposure as the power of the sun diminishes with the waning day. One of the best exhibits of apparatus was made by Messrs. E. A. and H. J. Anthony and Co., of New York. A detective camera of their manufacture was shown, a trifle larger than a cigar box, and was capable of being carried underneath one's coat. Its total weight, with lens, shutter, and double dry-plate-holder, is only three and one-eighth pounds. A small lens in the upper left-hand corner serves to throw the picture, not larger than a postage stamp, on a piece of ground glass on the top of the camera, thus showing the position on the ground glass. The focussing is done on the top, by the adjustment of a segment of a circle, and pointer which can be set for varying distances. If an object is supposed to be fifty feet away, the segment and pointer are set to point to the figure fifty, and so on. A shutter operated by a spring covers the lens, and is released by a small lever or button. The double plate-holders used with the box also possessed some novel points, and were made with a removable end, and peculiar interior springs, for ejecting the plates a little way out from the end of the holder, so that they may be easily taken hold of and removed by the fingers.

Another camera, mounted like a gun, for taking photographs of birds in flight and animals on the run, was exhibited. The instrument was about the size of a cigar box, and was secured upon the end of an imitation gun-barrel. Sight is taken on the object through a telescope three inches in length, that rests on top of the camera. When the bird is covered, the operator pulls the trigger, thereby automatically operating the shutter and taking the picture.

In lenses, one made by H. S. Suter, of Milwaukee, Wis., and known as the Suter lens, attracted much attention. With a small lens of this make it is said to be possible to make pictures of a large size, and some specimens of work shown seemed to substantiate all the inventor claimed.

The Blair Tourograph Company, of Boston, Mass., exhibited several novel forms of camera and plate-holders; also the Scovil Manufacturing Company, of New York.

Many forms and varieties of shutters were shown, including those that were simple, and others that contained enough machinery to operate a clock.

One of the newest, exhibited by D. C. Hoover, consisted of two vulcanised rubber slides, operated by a spring, and arranged to take the place of the diaphragms in the lens tube, and located between the front and back lenses. Each slide had a rectangular diamond-shaped opening, and both were adjustable to any opening of diaphragm desired, by a simple mechanical movement, and could be operated to make an instantaneous exposure either with a small or large diaphragm. The change from a small to any larger sized diaphragm could be effected in a second. The slides were encased in a neat rubber case, which, being arranged in the lens tube, formed a permanent attachment to it. The shutters are released by a lever at the upper side of the cases. Among the advantages claimed for it was the lightness of the shutter, its very rapid and free movement, its freedom from being interfered with by wind or dust, and the facility with which the size of diaphragms could be changed. Many kinds of plates, and also various forms of shutters, were tested each day. THE AMATEUR PHOTOGRAPHER.

New York, August 11, 1884.

By-the-Bye.

AIR, PURE AND IMPURE.

EXTREMELY impure water may generally be avoided, or at least only used when it is known that the impurities will do no mischief; but this is by no means so with air, as we are always taking in an approximately constant quantity, whether pure or impure. As regards the purification of air, we are almost entirely dependent on natural agencies, and in actual practice we can do but little more than endeavour to drive the impure air away from us, so that it may be replaced by that which is less contaminated.

One essential difference is to be noted between water and air: the former being a definite compound of its two constituent elements, and of course invariable in composition when free from accidental impurities; while the latter is merely a mechanical mixture of gaseous bodies. The two main constituents of air (nitrogen and oxygen) are always present in very nearly the proportion of four volumes of the former to one of the latter; and it is the oxygen which is of most essential interest to ourselves, not only as it is a main factor in the process of respiration, but also as an essential agent in the process of combustion; while the function of the nitrogen seems to be merely that of a diluent.

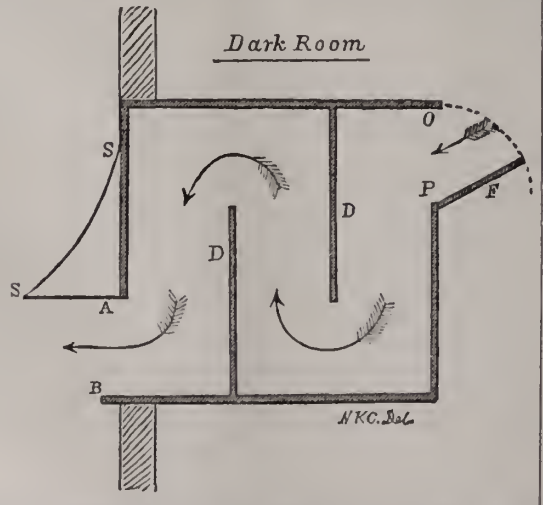
Respiration of animals and combustion are, indeed, essentially the same process, as in each case carbon and hydrogen unite with the oxygen of the air to form carbonic dioxide on the one hand, and water on the other hand; carbon dioxide being a compound of carbon and oxygen, while water is a compound of hydrogen and oxygen.

When the carbon and hydrogen unite with oxygeu from the air, heat is produced, as indeed is the case whenever two bodies enter into chemical combination or union. Now, vast as the store of air is round about the globe, it is obvious that this kind of thing must teli upon it in time, if there were no provision for balancing constaut withdrawals from the available stock of oxygen in the atmosphere. Plants, however, decompose carbon dioxide and water; the hydrogen and carbon being stored up by the plant as it grows, while the oxygen is liberated. This action is clearly the reverse of combustion, or respiration, and the fact that the heat, together with its physical equivalent light, disappears during the growth of plants, serves to make the respiration of a plant, if one may use the term, a complete antitype of combustion or the respiration of an animal.

In the coal beds we have an immense store of carbon and hydrogen which has been thus separated from the atmosphere by plants that flourished when solar light and heat were far more intense than they are at present, and in burning this coal we are drawing freely upon the stock of heat which was rendered latent and stored up long ago.

Thus we see that the ratio between the oxygen and the nitrogen of the air is kept up in nature by balancing influences; and taking the whole mass of the atmosphere, no permanent change in compositiou has been noted. Notwithstanding this, the proportiou of oxygen is very sensibly less in a crowded room than in the open air, and a slight difference may be traceable between the proportion in the air of a town and that in the open eouutry; in each case the increase of carbonic acid being proportionate to the diminution in the amount of oxygen. Still the unwholesome character of air which has been frequently respired is largely due to its contamination with organic impurities, and perhaps in some cases of germinal matter; but such substances are very soon oxidized and destroyed when the contaminated air can mix freely with the great mass of the atmosphere. Air purification in the strict sense is but rarely resorted to, free circulation, which brings into play the restorative agencies provided by nature, being the great remedy; and to the photographer the question of ventilation is an important one, as he may suffer in health from constantly working in dark-rooms where a sufficient change of air is not provided for.

In taking precautions against the entry of light into his dark-room, he frequently stops all circulation of air; still, there is not the least difficulty in providing for thorough ventilation without in any way incurring a risk of light



gaining ingress. A kind of ventilator excellently well suited for general use is one constructed on the baffle-plate principle, and a sufficient idea of such a ventilator may be gathered from the above sectional diagram.

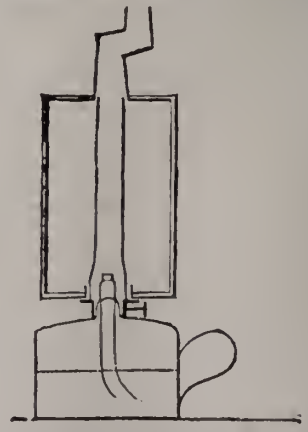
One or more ventilatois of this kind should be placed near the floor, and also near the ceiling; but if a little judgment be exercised in selecting suitable positions, far fewer bends will be required than are represented in the diagram. In fact, ventilators having a section such as is shown below, may be used; only in the case of those near

the floor, care must be taken that the openings look dowuwards and towards some dark and not very reflective surface; while those ventilators placed near the ceiling must have the openings directed upwards, and the outside openings should be screened from rain and the direct light of the sky by means of a strip of board inclined downwards. It is scarcely necessary to say that the inside of the veutilator should be painted black.

The dark-room lantern often serves to withdraw much oxygen from the air of the developing room, and it not unfrequently happens that owing to the imperfect circulation of air through the dark lamp, the carbon *monoxide* is formed, this being a product of the partial combustion of carbou.

The monoxide is extremely poisonous, very minute quantities being sufficient to produce headache and lassitude; while the dioxide may be present—and, indeed, always is present—in the air to a considerable extent without causing mischief; still, considering that an ordinary paraffin lamp or full-sized gas jet consumes as much oxygen in burning as is absorbed by the lungs of two men, the certain vitiation of the air is considerable, apart from the possibility of the highly poisonous carbon *monoxide* being formed.

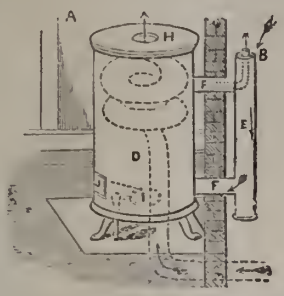
It is, then, an excellent plan to make the lamp itself serve as ventilator; this being quite an easy matter if the air outlet at the top of the lamp be connected with a sheet-iron chimney passing into the open air, there being no



difficulty in doing this, if a lamp constructed with a tubular outlet, like that represented above (Mr. Jarman's), be used.

When a gas stove is used as a source of heat in the

drying-room or in the dark room, it is very necessary to employ some form in which the products of combustion pass freely away, and in very many photographic establishments the so-called Calorigen stove of M. Georges is made use of. The subjoined diagram will explain its construction :—



A, the interior of the room; B, exterior of the building; C, wall; D, the Calorigen; E, a cylinder; F, pipes communicating to supply air for combustion and carry off product; G, pipe for passage of cold air to Calorigen; H, outlet for ditto, after being made warm; I, gas burner; J, door.

ON THE DEVELOPMENT AND INTENSIFICATION OF GELATINE NEGATIVES.

BY S. R. BOTTONE.

A great authority in photography, speaking of dry plates, declared that "he could teach anyone to make them, but that their development was a science."

The reason for this is clear to all who have had to do with our modern dry plates; and it lies in the fact that very little latitude is really admissible in the matter of exposure; or perhaps, to speak more exactly, that the sensibility of the film is so great, that a period of time, which would be a mere fraction of the total exposure in the case of a collodion picture, becomes a multiple of the normal exposure in the case of a gelatine plate. Suppose that the correct exposure for a portrait in a studio, with collodion, were fifteen seconds, and that inadvertently sixteen seconds were given, the result would undoubtedly be over-exposed; but the degree of over-exposure would be correctly represented by the fraction $\frac{1}{15}$. If, however, a gelatine plate, the normal exposure of which was half a second, were exposed one-and-a-half seconds, then it would have received an exposure three times as long as it ought to have had, and the result would ordinarily be a thin, flat, unsatisfactory image. It must also be borne in mind, that somewhat of the thinness of the images developed on gelatine plates depends on the condition of the plates themselves. Plates prepared with a large percentage of silver bromide or iodide are rapid and full of detail, but somewhat wanting in density; while those in which the haloid salt of silver is kept low are slower, harder, and capable of being made to give very dense images.

Again, the nature of the developer very much modifies the colour and density of the deposit. A slow-acting developer gives a hard black image; a strong, quick-acting developer gives one full of softness and detail, but with a tendency to flatness if the exposure has been at all prolonged.

If an image, the exact exposure of which is not known, be developed by a weak developer, and be found to come out too slowly, then the cautious addition of a stronger developer will remedy the defect, and bring out all detail *that is impressed*, without injuring the shadows.

Based on a knowledge of these facts, is the following mode of procedure, which, in the writer's hands, has invariably given excellent results, and allowed of considerable latitude in exposure.

Having exposed the plate—and it may be stated that with the ordinary run of English commercial plates the exposure will be nearly right if, with an aperture of $\frac{1}{6}$, an exposure of one second in sunlight, or two in shade, be given—it should be taken into a ruby lighted room, the light—about three square feet—being situated about four feet above the head, and flooded with the following solution, which should have been made up at least twenty-four hours, and exposed to sunlight in the interim :—

Saturated solution of ferrous sulphate	1 ounce
" " " potassium oxalate	3 ounces
Tartaric acid	2 grains
Potassium bromide	2 "
White sugar	60 "

The picture should be kept rocking during development, as the image will by this means be much more brilliant than if allowed to remain motionless.

The image should appear slowly. A quickly-developed image is almost invariably "flat, stale, and unprofitable;" whereas a picture which takes from five to ten minutes to bring out is almost always a good one. For this reason it is well to have at hand an ounce bottle containing a saturated solution of potassium bromide, a few drops of which may be cautiously added to the developer if the image shows a tendency of appearing too quickly. When the image shows fairly on the surface, look at the back of the plate; if the high-lights show through distinctly, and the half-tones slightly, the picture is sufficiently developed. Now remove it from the developer, and place it at once in a dish or bath containing clean water, which must be changed after each plate.

Having washed the plate well, examine it carefully before a yellow light for density. If it appear sufficiently dense to give a satisfactory print, immerse at once into the fixing bath—consisting of a saturated solution of sodium thiosulphite in water, and when cleared from the haloid salts, plunge for a few minutes into a solution of chrome alum (strength about 1 ounce to the pint); then wash thoroughly. Should the picture appear altogether too slowly while under the influence of the developer, add to this latter a little fresh ferrous oxalate, made by mixing 3 parts of the saturated potassic oxalate solution with 1 part of saturated ferrous sulphate solution. This should be added, about a drachm at a time, to the mixed developer, until the image is satisfactorily developed.

The developer, when used, must not be thrown away, but placed in a glass bottle furnished with a tightly-fitting cork, along with 1 grain of tartaric acid to each ounce of solution. The bottle should then be placed where it can get the direct rays of the sun. This sunned developer is excellent for starting the development, and yields pictures of extraordinary density and delicacy of detail.

Should the pictures, before fixing, show a lack of density, though full of detail, the following method of intensification will be found to yield excellent results.

Prepare a solution of chlorine by shaking up 1 ounce of fresh dry chloride of lime with 1 pint of water. Allow the solution to clear itself in a stoppered bottle, which must be kept in the dark. Pour out about half-an-ounce of this solution in a measure glass, and add to it 2 or 3 drops of tincture of iodine. Flood the plate with the sherry-coloured fluid, and pour off and on, for at least one minute. Wash thoroughly, until no smell of iodine or chlorine is perceptible. Now flow over the plate a couple of drachms of the following intensifier :—

Pyrogallol	1 grain
Citric acid	1 "
Water (distilled)	1 ounce

To which must be added, after the solution has permeated the plate, and returned to the measure glass, a few drops of the following solution :—

Argentic nitrate	20 grains
Water (distilled)	1 ounce
Glacial acetic acid	1 drachm

Plates may be intensified to complete opacity by this means,

without any tendency to green or red fog, the shadows remaining as clear and bright as in a good collodion negative.

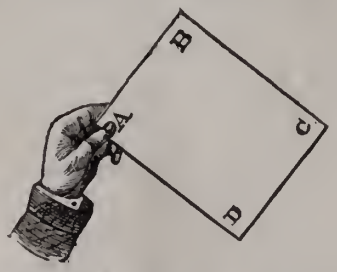
Should the picture have been fixed before the want of density has become apparent, intensification may be performed with the same solutions, and with results which are at least equally good; but then it is a *sine quâ non* that the fixed plate should have been soaked for at least five minutes in chrome alum water, and fifteen minutes in chloride of lime water. The use of chloride of lime water is absolutely essential to success, as it removes (by decomposition) every trace of sodium thiosulphate, which otherwise causes re-development to be a failure, by causing browning, stains, and reversals.

It must be remembered that no amount of intensification can bring out details which are not impressed; but given a plate, let it be ever so much over-exposed, short of reversal, it is possible, by slowing the development as above advised, to get an image, faint in proportion as the exposure has been prolonged, but full of detail, and fairly balanced; which image, by entirely checking the action of light by means of the mixed chlorinated iodine water, may then be built up to any desired degree of intensity by an acid pyrogallol intensifier.

Practical Papers for Beginners.

No. 7.—PRINTING FROM THE NEGATIVE.

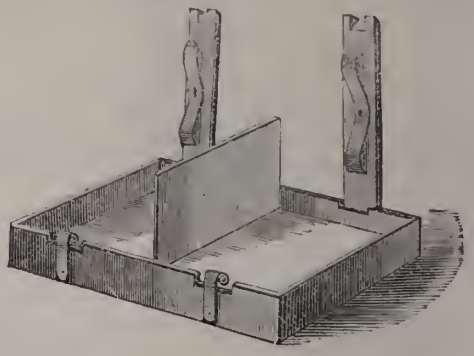
The negative having been thoroughly washed and dried, should be varnished before any prints are made from it, as otherwise the film may absorb silver from the sensitive paper used in printing, and become stained beyond remedy. Even although the negative may appear quite dry, it is as well to allow it to remain in a warm place for an hour or two before varnishing, as a trace of moisture may cause the varnish to break up, and may lead to the premature destruction of the negative. Having now made the plate so warm as to feel pleasant to the hand, by holding it before a fire, or over a gas flame, it is held horizontally by one corner, as shown in the subjoined diagram, and a



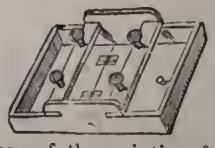
quantity of varnish is poured over the central portion; a very slight inclination of the plate now serving to make the pool of liquid flow successively to each corner. The next step is to drain off all excess of the varnish at one corner, and when no more varnish drips from the plate, it is again warmed, preferably by holding it before a fire. It is now allowed to become so hot as to be uncomfortable to the back of the hand; and, when, cool it is ready for printing from. It may be noted that the mere warming before a fire or over a gas flame, immediately before varnishing, cannot be relied upon for removing the last traces of moisture from the film, as damp gelatine parts with its water very slowly.

Special varnishes for use in protecting negatives are sold by the dealers in photographic materials; but those who prefer to make their own may obtain a very excellent varnish by dissolving two ounces of white shellac, two ounces of sandarac, and one drachm of Canada balsam in sixteen ounces of methylated spirit.

The positive print is made by placing a piece of paper so prepared that it will darken one xposure, behind the negative, and allowing the light to shine through the negative until a sufficiently vigorous image is the result. We may suppose that the beginner obtains the sensitive paper already prepared, as it is now kept in stock by all dealers; but those who wish to prepare their own need only refer to the comprehensive "Lessons on Silver Printing" which appeared in the Photographic News during 1883. Exposure to light is managed in a printing frame, the essential parts of which are a rebated frame in which a thick sheet of plate glass is usually set, a hinged back and bars provided with springs or screws for keeping the negative and the sensitized paper in close contact. The following diagrams will give an idea of some usual patterns of



printing frame, that provided with screws being generally preferable to that in which the pressure is regulated by springs.



See that the glass of the printing frame is clean, and lay the negative, face upwards, upon it. Next cover with a sheet of sensitive albumenized paper, cut to the proper size, care being taken that the sheet is placed smooth side downwards. A few thicknesses of blotting-paper are now laid over, the hinged back of the frame is placed in position, and the bars are brought down so as to keep all in its place, an adjustment being made with the screws if required. Exposure is generally best made in bright diffused daylight, although the printing can be performed much more rapidly in sunlight. In order to watch the progress of the printing, one bar of the frame is undone, so that half of the print can be examined; and it is always necessary to print a few shades darker than the finished print is intended to be, as the subsequent operations of printing and toning lighten the photograph considerably, the exact extent to which the over-printing must be carried being only learned by experience. It is convenient in practice to expose a number of prints before proceeding to tone and to fix, the impressions being stored in a dark box as they are taken from the frame. The work of cutting up the paper, changing the frames, examination of the prints on their removal from the frame, need not be carried out in the usual developing room, an apartment illuminated by a small window or by gaslight answering well.

The first step towards toning is to rinse the prints in three changes of clean water, allowing about five minutes each time; after which they are immersed in the so-called toning bath, which may be compounded as follows:—

Water	...	...	...	16 ounces
Acetate of soda	...	...	...	40 grains
Chloride of gold	...	...	...	2 ,,

The chloride of gold is sold in tubes containing 15 grains,

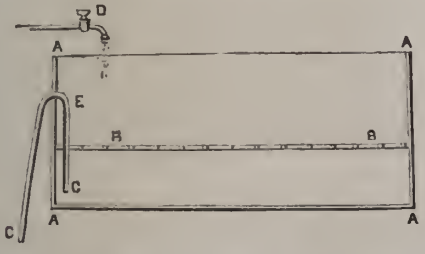
and it is convenient to dissolve the contents of one of these tubes in 15 drachms of water, so that instead of weighing out two grains of the salt, the more convenient plan of measuring out two drachms of the solution may be resorted to. It is generally well to make up the toning bath two or three hours before it is required for use.

While in the toning bath, the more or less reddish prints will gradually change in colour, and when a black-purple is arrived at, the toning may be brought to an end by removing the prints from the bath and placing them in clean water. The exact tone or tint to be produced is entirely a matter of taste, and the beginner will soon find that he can control the tint within very wide limits by allowing the gold solution to act for a longer or a shorter time, the lessons on silver printing already referred to dealing thoroughly with this matter; but in order to ensure uniform action of the toning solution, the prints should be kept in motion during the whole time.

Before proceeding to the next operation, that of fixing or dissolving out the unchanged sensitive compound which is contained in the paper, it is well for the beginner to put away his toning solution, and also the dish in which it was used, as the compound used in fixing is especially mischievous if it should find its way into the toning bath.

The fixing solution is made up by dissolving four ounces of hyposulphite of soda in a pint of water, and adding thirty drops of liquid ammonia. Cold is produced by dissolving of the hyposulphite in the water, and it is well not to use the solution until it has acquired the temperature of the surroundings. The fixing bath or solution having been poured out into a suitable dish, the prints are immersed, and are kept gently moving in the solution for fifteen minutes or so. After this they are several times rinsed in water.

Now comes one of the most important operations—that of soaking out every trace of the hyposulphite of soda, as rapid fading is likely to result if any of this salt remain behind in the prints. Half-a-dozen changes of water, with an interval of two hours between each change, may be sufficient in ordinary cases; and it is a very common thing to provide an automatic arrangement for making the requisite washings. A good apparatus of this kind is shown below,



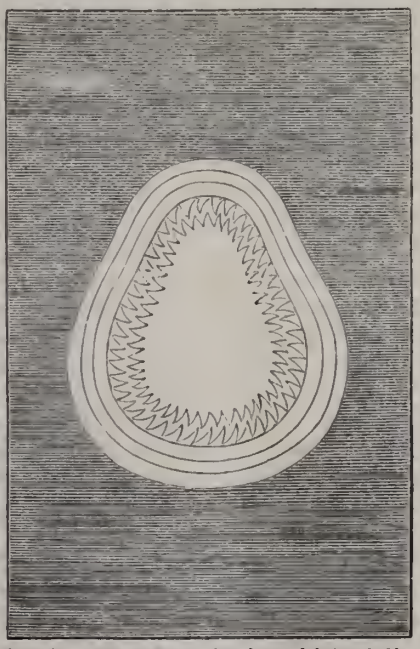
and it scarcely requires explanation. The prints are placed on the perforated plate, B B, and the water is allowed to flow slowly in. When it reaches the bend E in the syphon, the trough is emptied rapidly, again to be filled by the drip or slow stream from the tap. If such an apparatus as this is set in action at night, with the tap adjusted to the correct flow, the prints may be considered washed in the morning.

The prints are taken from the water, and the surface water is removed by means of clean white blotting-paper, after which the prints are pinned up by one corner to dry.

The mounting of the prints on cardboard is a very simple affair; but before mounting it is usual to trim them so that a neat edge shall be shown. A sharp penknife, guided by a rule or a glass cutting shape, answers well for trimming the photographs, the print being laid down on a plate of glass or a sheet of zinc, the latter being preferable, as it does not so rapidly take the edge off the knife. Thick and freshly-prepared mucilage of gum-arabic is one of the best mountants, and no special instructions are required for its use, excepting that as little as possible should be used. The mounted prints, when nearly or quite dry, are much improved by being rolled or burnished, and a fairly satisfactory result can be obtained by using a moderately warm laundress' iron with a sheet of paper interposed between it and the photograph. A rolling apparatus like that represented below is, however

more convenient and effective, and does not cost very much if the size is small. Other pressing and burnishing arrangements are described in the place already referred to.

It often happens that the vignette style of printing is preferred, and although this is most frequently the case with portraits, it often happens that a little bit of scenery, such as a country church, or a group of trees, may be vignetted with advantage. A graduator or vignetting plate, of which one kind is represented below, is fixed in



the printing-frame, as shown in the subjoined diagram, so as to shade the edges of the paper and keep them white.

The vignetting plates are sometimes made of glass, being orange at the edges and white in the centre; while in other

cases they are built up of layers of tissue paper, as is the case with that shown in our diagram. Openings of various patterns may be had, but some judgment is always required to obtain a good vignette picture, and the vignetting plate should not be placed too close to the glass of the printing-frame. Many persons make very excellent vignette pictures by placing a border of cotton-wool outside the printing-frame.

Notes.

Dr. Lohse's photograph of the sun, which we publish this week, is one out of a series of more than 600 which have been taken at Potsdam since 1881. No records of sun-spots can be of such exactness and value as photographic records; and the particulars given on page 545 will be read with interest.

It is the intention of the Trustees of the National Gallery, as soon as the photographic reproduction of their masterpieces is completed, to publish officially a selection of the photographs, with critical and descriptive letter press. What has long since been done for the great art galleries of Paris, Madrid, the Hague, Munich, Rome, and other capitals, is, in fact, at length to be done for England's national collection, though it is only very sanguine individuals who anticipate that it will be done as well.

If it be indeed true that the Government inclines favourably to the notion of ere long supplying London with a building worthy of the rapidly increasing importance of our collection of national portraits, the country has good reason to congratulate itself. The proposed site of the new gallery—viz., the ground on which Lord Carington's town house now stands in Whitehall—is an excellent one, and should the suggested plan be carried out, Mr. George Scharf will have ample room at his disposal for the carrying out of those photographic precautions which, as a discreet curator, he fully appreciates.

The immediate cause of the unexpected consent of the Treasury to take this matter into consideration is to be found in what is taking place at Edinburgh, where two successive and munificent gifts of £10,000 have been placed at the disposal of the Government towards building a Scotch National Portrait Gallery. It is only since the new building was actually commenced that the provision of a suitable gallery for England's national portraits has become a burning question.

A distinctive feature in all English photographic Associations is the good feeling which exists between the two classes of members—professionals and amateurs. This is not quite the case in America. The amateur photographers of Chicago, for instance, want to start a new society, as they are not satisfied with the way in which the present one "seems mixed up with the professionals." On the other hand, the society of professionals is not pleased because it has become "mixed up" with the amateurs. We should be inclined to think that the more they are "mixed up" the better for both.

"In answer to yours of the 25th inst., I shall be pleased to meet you at the place and time you propose, and the enclosed photograph will assist you in recognizing me."

Arranging to be recognized by allowing one's handkerchief to hang out of a pocket, by flourishing a rolled-up newspaper with the right hand, or by committing some other act of eccentricity, is certainly less satisfactory than sending one's photographic carte-de-visite. Of course we sent our photograph in return, and the recognition was immediate and mutual.

The photographic carte-de-visite has always been an album portrait rather than a visiting card in the ordinary sense; but why, indeed, should not an actual photographic card for every-day use become common? It would merely be necessary to attach a postage stamp portrait to the back or front of the usual visiting card.

Although very popular just now in the United States, the stamp portraits are not often seen here; in America they are sent out in sheets, ready perforated and gummed.

Supposing that postage stamp portraits were generally to be found in a card-case or the pocket-book, no inconvenience would arise from a railway company insisting on a portrait being supplied for attaching to every season ticket issued; or from a similar requirement being made as regards passes to exhibitions. Although all can appreciate the obvious value of the adhesive portrait when attached to a letter of credit, passport, or other certificate of identity, it is perhaps not generally known that some fourteen years ago a patent covering such uses of a photographic portrait was applied for, but not proceeded with (Baylis, "A means of preventing impersonation," 1870, No. 385).

About eight hundred English were present at the meeting of the British Association in Montreal on Wednesday, and Lord Rayleigh, in his presidential address, touched on the great scientific problem of the day—a correct estimation and representation of energy in its various manifestations. As regards the quantitative estimation of the dynamic equivalent of light but little has been done; but Lord Rayleigh spoke highly of the labours of Abney in mapping out the peculiarities of the spectral region beyond the red—where, indeed, it is difficult to know whether we should term the radiant energy light or heat.

Langley's investigations—based upon the influence which radiant energy exercises upon the conducting power of selenium—prove that the atmosphere cuts off an enormous proportion of the more refrangible rays, so that the sun appears far less blue than it would to an observer placed outside our atmosphere.

A new power having been placed in the hands of the spectroscopist by the diffraction gratings of Professor Rowland, one may, according to the President of the British Association, expect fresh results of importance; and Becquerel's investigations upon the remarkable action of the ultra-red rays in enfeebling the light emitted by phosphorescent bodies are likely to open up new paths for scientific exploration.

The publication of the Claimant's protest in the papers has had the effect of overwhelming those of his friends supposed to be much in his confidence with applications from photographic artists, all of whom are eager, on various conditions, to become his photographer-in-chief. One of the first matters of moment he will have to decide, on emerging from durance vile, will be as to the disposal of his photographic patronage. He will, in fact, have to arrange for the necessary sitting in this case, even before he discusses the details of that seat in Parliament which, it is again asserted, he intends to obtain.

Two million copies of a photograph is something like an order. This is the number of portraits of Mr. Blaine, the Republican candidate for the Presidency of the United States, which one firm has to turn out at the rate of some 67,000 per day.

Mr. Cecil V. Shadbolt's steady progress as regards photography from a balloon leads us to hope for useful applications of this branch of the art; but until some progress is made in the steering or controlling the movement of a balloon, all work with the camera must of necessity be very uncertain.

As to steering, no advance has been made, and yet the conditions under which a balloon can be steered are perfectly understood. A motor is required which will drive the balloon so forcibly through the air, that it shall be able to outstrip the strongest wind. It requires very little mathematical knowlege to prove the utter inability of any motor now known to direct a balloon, unless when the atmosphere is practically still, and if those newspaper *canardists* who so frequently and so persistently announce the practical solution of the problem would get someone else to calculate out the horse-power required to drive a balloon of given magitude at a determinate speed through the air, we should hear less about the the steering of balloons being an accomplished fact. It is, indeed, demonstrable that less motive power would be required to drive a flying machine against a strong wind, than to so drive a balloon; but both operations are far beyond the power of our existing motor engines. Still we may hope; but the first step is the invention of a sufficiently light and powerful motor engine, and other applications of such a motor as is required would almost revolutionize the world.

A comic contemporary has been finding in photography the matter for a "humorous narrative." A much married husband is photographed by a peripatetic artist at the seaside in the absence of his wife. On being subsequently shown the "proof," he finds that the rascally photographer has contrived to introduce the likeness of a bold, bad female into the picture—has, in fact, placed her in the innocent husband's arms. On the strength of this the r. p. demands and obtains hush money. And in his renewed applications for black mail and the much married man's consequent victimizing, the fun of the sketch may be supposed to exist.

The idea of all this is, of course, not a new one; the moral, "Don't be photographed by peripatetic artists" ought not to require further enforcement. It is interesting to note, however, how frequently, and appropriately some would say, photograpy is brought into our light literature. Mr. Malloch's use of it in his "Nineteenth Century Romance" is fortunately as exceptional as it is ill-advised. But those who have read Mr. Thomas Hardy's "Laodicean" will remember that the love-suit of the hero is hopelessly checked by the use of manipulated photographs of her rival.

This rival, by means of a well-known device which Mr. Hardy found out to be possible before he used it, manages to produce some cartes in which the sober and unexceptionable hero is represented with a face bespeaking seemingly an idiotic stage of inebriety. He takes care that one of these portraits shall come into the heroine's possession, the result being the postponement of the happy climax of the story for two volumes.

But this exordium deals with the past, and the item of more immediate interest we have to allude to is the announcement that a dramatic satire, in which the camera will play an important part, has been written, if not on fact, yet passed by the "Licencer of Plays." One scene—in which a professional beauty is chased by a horde of photographers, each armed with his apparatus, and, in spite of her protests, is photographed in every passing position she assumes, and which concludes with a kind of *Camera Ballet*, with novel effects—ought to be a success.

Another scene is a shop-window which will occupy the whole back of the stage, and on this enlarged photographs will be displayed in novel combinations which will themselves have a satirical interest. It is proposed, too, that the "Auditorium" shall be actually photographed from the stage in the course of the piece each evening.

The argument which publishers of engravings use against photography, that it destroys the value of an engraving by being able to produce copies of a picture at a much cheaper rate, has recently been shown by Mr. Seymour Haden, the well-known etcher, to be a most disingenuous one. Mr. Haden brings a serious charge against publishers of prints, to the effect that they systematically disregard the obligation to destroy a plate after so many proofs have been produced, and go on printing even after

the plate is worn. The artist's "stamp," which many people suppose is a guarantee that the print is one of a limited number, is no guarantee at all when the number of prints is unlimited. Mr. Haden mentions as examples, "The Allied Generals before Sebastopol," "The Derby Day," "The Relief of Lucknow," and others, the plates of which were in every case to be destroyed, and yet are printing at the present day. If this be so, what the print publishers are afraid of is the dangerous rivalry which photography sets up against the cheap and inferior "pulls" from a worn-out plate. It is clear, however, that this admission will never, in the present state of things, be made, since to do so would disclose the secrets of the prison house.

A lady of the "Dora Copperfield" type, who lately noticed in an advertisement the term "gelatine plates," opined that they must be what people used with "jelly glasses!"

The Chinese Government has initiated a new era in diplomatic negotiations. It has had the Fournier Treaty, in which the terms for the evacuation of Bac-Nin are cancelled, to be photographed, and has sent copies to the Powers. The Chinese assert that the date of the evacuation is not mentioned in the Treaty, and to prove they are right, the document has been photographed.

Our anticipation of a popular title for next year's Exhibition in the term "Inventories," has led to several suggestions being forwarded to us. One is that a shorter and more easily pronounced name for the exhibition of patents would be the "Patentries;" whilst a second, *apropos* of the fact that "Musical Instruments" will also form a prominent feature in next season's show, proposes, after discarding "Instrumentories" as too long, that the chosen name shall be the "Musicries!"

Meissonier uses photography largely. His practice is, after designing a picture, to have the figures forming the group photographed first as a group, and afterwards singly. Perhaps no painter is so scrupulously careful in the preparation of his work. His outlay to models is something enormous, on one occasion paying a man as much as two pounds the hour to lie half covered with snow. It is not every artist who could afford to do this, but then it is not every artist who is paid so well as Meissonier.

A writer in our contemporary, *La Production*, points out that great international exhibitions are by no means to be regarded as belonging exclusively to modern times, for the Book of Esther records that the exhibition which King Ahasuerus held in his palace of Shushan was kept open for no less than six months; while the exhibition organised at Venice in the thirteenth century by the Doge Tiépolo was by no means a small affair. More recent exhibitions are mentioned, as those organised under the patronage of the Society of Arts in 1756 and 1761; also the exhibition held in Paris during 1797. In the first year of the present century, a greater exhibition than that previously held in Paris was organised by Napoleon—then first Consul. On this occasion gold and silver medals were awarded by a jury of experts.

Patent Intelligence.

Applications for Letters Patent.

11,556. EUGEN HIMLY, 28, Southampton Buildings, Chancery Lane, W.C., for "Improved method of and apparatus for taking photographs by artificial light."—(Complete Specification).—Dated 22nd August, 1884.

Specification Published during the Week.

4989. JAMES STURROCK, Bank Street, Dundee, in the County of Forfar, North Britain, for "Changing sensitized plates in photographic cameras."—Dated 17th March, 1884. *Complete Specification).*

The first part of my invention relates to cameras of the ordinary well-known kind in which pictures are obtained by exposure in the camera of glass plates properly sensitized. It has for its object a novel method of constructing such cameras, or slides for cameras, so that the sensitized plates can be readily changed when required. I make at the back of the camera a space to hold a sensitized plate; this space is open above, and is provided with a flange or other similar device, to which can be readily attached by an elastic band or other convenient means the open mouth of a bag made of paper, cloth, india-rubber, or other suitable material impervious to light; or it may be made of tin, cardboard, or other rigid substance, with a flexible neck or mouth of rubber or cloth suitable for attachment to the camera. I fill the bag in a dark place with a sensitized plate, and then close or fold the mouth to exclude the light, and secure it by a spring, clip, elastic band, gum, or their equivalents; and having fixed its mouth to the camera, as already described, I remove or undo the fastening, invert the bag, and deposit the sensitized plate in the camera. After exposure, the plate is again slipped from the camera into the bag, and the fastening again put on, and the bag, with the plate, removed from the camera, when another bag containing a plate can be attached. The plates can be stored away in the bags both before and after exposure.

In the second part I make a separate holder or slide, having a space to hold one or two sensitized plates, as in the ordinary dark slides, but having a flange, or other similar device, to which the bag can be attached, and a plate or plates put in, as already described, and which can be inserted in the back of the camera in the usual way. The accompanying drawing shows bag folded

so as to exclude the light and attached to camera.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

First. The arrangement in cameras or slides for cameras for enabling flexible bags to be attached substantially as described.

Second. Flexible bags for conveying plates to or from th

camera or slide, made so as to fold or close at the mouth, and secured by a spring, clip, elastic band, gum, or their equivalents.

Third. Bags, by means of which sensitized plates can be placed into or taken from the camera or slide, without introducing the hand or other agency into the inside of the bag.

FRENCH CORRESPONDENCE.

INSTANTANEOUS PHOTOGRAPHY—MACDOUGALD'S DEVELOPER TUBES—CHAMBRE SYNDICALE OF PHOTOGRAPHY.

Instantaneous Photography.—Photographic doings are difficult to relate at this time of the year, when everyone is taking holiday: scientific meetings are suspended, and amateurs are scouring the country, taking instantaneous photographs as reminiscences of their visits. Nothing is more delightful than to go about and thus reproduce the scenery around. Although not difficult of attainment with practice, instantaneous photography requires thoroughly good apparatus; the lens must be of the best on account of working with full aperture, and the calculation of varied exposures with a shutter takes some time to learn. During a stay on the coast of the Mediterranean, my leisure time has been taken up in photographing vessels in motion. The most delicate focussing is required in this exercise, and in the case of a ship sailing swiftly it is difficult to focus carefully the zone of sea through which it will pass, without having any point to aim at directly. No rule can be given as a guide in such cases. When boats are taken sailing on rivers or canals, objects on the banks guide one as to the focussing point; but on the sea, at a distance of from one hundred to two hundred metres, how can one measure the point exactly? An indicator of some sort may be arranged by using a little lens, having its course graduated in such a manner that a given point can be made to correspond with the same in the large lens. For instance, the indicator marking a certain point or notch (No. 10), by placing the lens in focus of the same number the object to be taken is in view. This is how I use the indicator, which really constitutes a kind of telescope having the same focus as the lens. The operator, standing by the camera, views the ship through the indicator a short time before it passes across the camera, then, when clearly defined, the lens is focussed to coincide with it. I cannot find any more expeditious way of obtaining the desired result. Time does not permit of employing the camera itself to focus on the ground glass.

Macdougald's Developer Tubes.—The idea of preparing the developer in tubes, so as to carry them about easily without risk, is excellent. To tourist-photographers and others obliged to carry photographic apparatus in as small compass as possible, I highly recommend this invention as possessing the qualities of solidity, permanence, and compactness.

Photography at Lyons.—The photographers of Lyons have just organized a syndical chamber, under the presidency of M. Bernaud. The fact tends to show how photography follows in the steps of all other industries. It does not number many professional photographers yet.

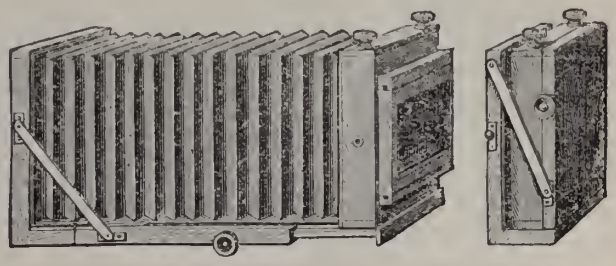
LEON VIDAL.

HOW TO PHOTOGRAPH MICROSCOPIC OBJECTS.

BY I. H. JENNINGS.

LESSON II.—PHOTOGRAPHIC APPARATUS.

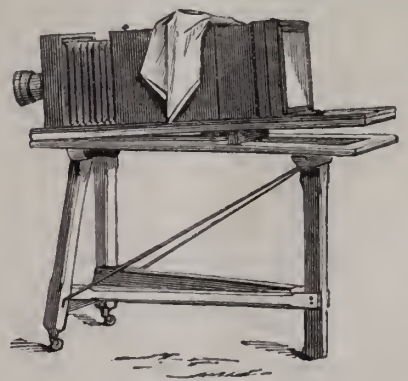
FOR simple photo-micrographic operations, any ordinary camera may be employed. A quarter-plate camera will answer, but the student is advised to obtain a half-plate, or even a whole-plate camera, for, as he advances in skill, he will, perhaps, wish to photograph sections of rocks, or woods, or whole insects, on a larger scale than the smaller camera will allow. A good lens will make a half or whole-plate enlargement of an object without loss of definition. Using the eye-piece, and working with low powers, a camera expanding to eighteen inches or two feet will suffice, but for the higher powers, which cannot well be used in conjunction with the eye-piece, a camera expanding to four feet, or even six feet, is recommended. The eye-piece cuts off so much light when working with high-power lenses, that focussing becomes difficult, if not impossible; while without it, focussing with a $\frac{1}{12}$th inch or $\frac{1}{15}$th inch is an easy matter, even when a condenser is not employed.



LONG FOCUS CAMERA, SUITABLE FOR PHOTO-MICROGRAPHY.

If an ordinary camera be employed, there are none better than those sold under the name of "long focus" cameras. The half-plate size expands from three inches to eighteen inches or twenty inches, which is ample for low powers, especially when working with the eye-piece. The above illustration shows a capital "long focus" camera, introduced by Hare, which will answer both for landscape and microscopic work, and form an excellent companion for the summer holidays, when the microscope will be, or ought to be, laid aside. Even the expert photo-micrographer will find the occasional practice of landscape photography a very good way of "keeping his hand in."

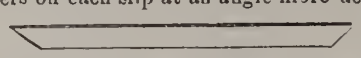
A long copying-camera, provided with focussing arrangements back and front, makes a very excellent camera for photo-micrography. It is very desirable that the front should not be fixed to the base-board, but be capable of either sliding back or moving back by screw, for frequently it may be necessary, after all is ready for taking a photograph, either to change the position of the object, or alter the illumination, which can be satisfactorily performed only by looking down the microscope tube. If the camera has to be removed for this purpose, there will be some difficulty in getting everything square again; while if the camera-front can slide back along the base-board, the relative position of microscope and screen remains unaltered. Copying cameras suitable for photo-micrography are to be met with in the lists of most dealers in second-hand apparatus.



COPYING CAMERA.

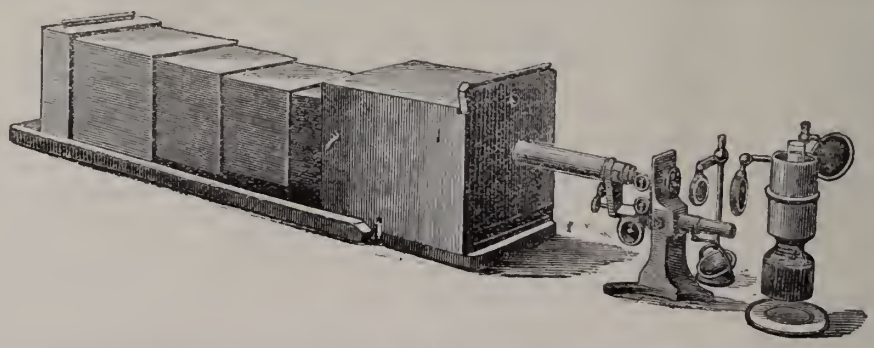
If the student cannot procure one of these cameras, he may very easily construct one for himself. Procure four boards nicely planed, $\frac{1}{4}$-inch thick, some inches longer than the proposed camera, and $\frac{1}{2}$-inch less in width than the bellows are required. Make a long box with the boards, fastening them together at the ends only with screws.

Cover this box with thin black calico or book-binder's cloth, pasting the edges together where they lap over. Next cut some slips of thin cardboard $\frac{1}{2}$-inch or $\frac{3}{4}$-inch wide, and $\frac{1}{8}$-inch shorter than the width of the box. Cut the corners off each slip at an angle more acute than 45°, thus:—



When sufficient have been cut, paste the slips exactly parallel on the four sides of the box, about $\frac{1}{8}$-inch or $\frac{3}{16}$-inch apart. Each slip must be pasted on with the cut-off ends facing in the same direction. When the paste is dry, put on an outer cover of better material; twilled calico will do, but is somewhat thick for the purpose; good book-binder's cloth is best. The edges should be pasted together as neatly as possible. When the whole is dry, unfasten the end screws, when the boards will collapse, and the bellows can be drawn off. Now proceed to fold it up carefully, by pinching it into shape at the edges of the slips of cardboard, and put the bellows in a copying press, or under heavy weights, for a day or two. The base-board for this bellows should extend in front about 3 feet, so that the microscope and lamp may stand upon it. As the bellows will require no protection, the camera-front may consist of a plain vertical board, of the right size, constructed to slide back on the base-board about 15 or 18 inches. The dark slide should be purchased, preferably a single one, and the back of the camera made to fit it. The camera may be opened or closed by hand alone, the back moving in guides screwed along each side of the base-board; or by endless screw, cut with rather a coarse thread. When the endless screw is not used, a screw and butterfly-nut must be employed, to clamp the camera in any desired position.

If the student has not sufficient hand-skill to construct a bellows camera, he may make, or have made, the simpler arrangement represented below. As will be seen, it consists of a series of boxes, fitting into each other after the fashion of a sliding-body camera. It can easily



be lengthened or shortened by the addition or removal of one or more boxes. Any joiner could easily construct such a camera on seeing the illustration.

Double dark-slides may be employed, if well made, but a single slide is better, as the focussing-glass can be placed in it, and when replaced by the sensitive plate, the latter will lie in exactly the same place, which is of vital importance. For low powers, very fine ground glass will answer, but for higher powers, plain glass is best. In this case the image must be examined by means of a focussing eye-piece. The following excellent mode of performing the difficult operation of focussing is given by Mr. G. E. Davis, in "Practical Microscopy":—"Removing the ground glass slide, another is substituted of mahogany, but pierced with a series of seven holes, into each of which the ordinary A-eye-piece may be fixed. The thickness of the slide is such, that when the eye-piece is pushed in as far as it will go, the diaphragm lies in the same plane as the ground surface of the glass slide. To anyone accustomed to focus by the old method, the present system will be found a considerable improvement, it being easy under these conditions to obtain a sharp focus with an ordinary paraffin lamp when using the $\frac{1}{16}$ objective."

When the camera is extended only a short distance, the hand will be able to reach the coarse or fine adjustments of the microscope; but when drawn out to three feet or four feet, this will be impossible. It then becomes necessary to provide some method by which focussing can be easily and exactly performed while viewing the image on the screen, the camera being extended. Procure a hollow brass rod, $\frac{1}{2}$-inch in diameter, and the length of the base-board. Fix it to the side of the board by metal "eyes," so that the rod may revolve somewhat stiffly; if the camera be supported on trestles, the rod may be fixed under the base-board, which is more convenient. Make a grooved wooden wheel, two inches diameter, and fasten it to the rod, so that it will be opposite the fine adjustment of the microscope when the latter is placed horizontally, with the eye-piece end fitted to the camera-front. Make an endless band of narrow tape, of such a length that it will pass over the grooved wheel and the fine adjustment rather tightly. On turning the extremity of the rod, the fine adjustment will be moved with sufficient slowness and accuracy to allow of correct focussing with a lens of high power. The writer has long used an arrangement of this sort when photographing diatoms, and found it answer admirably.

The remaining photographic apparatus will be as follows:—A macintosh focussing-cloth; ebonite or glass dishes for developing and fixing negatives; glass measures, say, 2-oz., 4-oz., and 6-oz. capacity; basins for washing negatives; a porcelain dish for toning prints, and another for fixing them. Racks may be used for drying the negatives, but in winter, standing them up on a warm mantelpiece is as good a plan as any, unless the plates be made with very soft gelatine, when catastrophes may be expected in the shape of distortion of the image, or even melting of the gelatine.

ON THE BUSINESS MANAGEMENT OF PHOTOGRAPHY.

BY J. RYDER.*

The first necessary requirement—the foundation stone—is a thorough knowledge of every department of the work. An intelligent understanding of one's business is solid capital. The more of that element a man carries the greater is his strength. As we have no established system of apprenticeship, no regular course of study or practice of our young art, the learner is dependent upon a haphazard chance, his aptness at catching an idea, with a natural handiness in taking to new work, a taste for art, and even in a small way prove his good friends in grasping photography.

Then we could expect intelligent skill in our employés, and the public could feel assured they were being served in a proper manner.

Truly knowledge is power. It is recognized and respected by the learned and ignorant alike.

The coloured servant of a surgeon, explaining why his master

* Abstract of a communication read before the recent Cincinnati Convention.

charged twenty-five dollars for the performance of an operation in surgery which took but ten minutes to do, said he charged five dollars for the work, and twenty dollars for the know how.

To fit ourselves in the best way for the pursuit of our art, which is becoming yearly more an art, and more closely allied to science, buy books, subscribe for journals, magazines, and papers upon the subject; make your collection of photographic literature a special library, then make its acquaintance—the more intimate the better. In this way you become master of the requirements of your business, which is a rock-bottom foundation upon which you may build with all confidence and security.

Educate your assistants, teach them in the little points and in the greater ones, train them to your ways, give them your idea, and listen fairly to theirs—you may sometimes get the best end of the bargain in such exchange.

Next in value to superior quality in your productions is a safe and careful system in all the various departments, from writing an order for a sitting to delivering the finished picture into the hands of your customer. Such system should be observed. The soul of that system should be order and cleanliness.

There may be to some an affectionate interest in collections of antiquated relics of good old days, whose dust-coated and deep-stained fronts attest to long years of service, and certify to the claim of old stager. Many a well-meant operating room harbours in its corners and along its side-walls collections of crippled head-rests, rickety camera-stands, faded chairs with long-fringed upholstery, broken balustrades, old camera-boxes, &c., which are in no sense ornamental or advantageous.

It is a mistake to make a museum or a junk-shop of the operating room. Remove the old trash, give the scrub brush, the paint pot, and the whitewash tub a chance. If there be a worse smell than the atmosphere of a justice's office, it is the musty odour sometimes encountered in a slovenly-kept photograph gallery.

The man who satisfies his conscience that he cannot afford to expend money in thoroughly renovating as often as once a year, and refurnishing when needful, is a poor manager, and works against his own interest. Nothing commands more prompt respect than tidyness. A seeming of prosperity soon brings the reality; people like to patronize a prosperous man, and naturally avoid a poor unfortunate one; all which shows an air of thrift and systematic order should be practised and enforced.

Keep your show of specimen pictures fresh by frequent changes. Your customers will visit you oftener if you have new attractions. They will take pride in you and make your establishment one of the places to be visited by strangers and their visiting friends, among whom you will find good customers.

How to treat with customers. Here comes the place for exercise of judgment, for real generalship. To be polite, attentive, genial, and at the same time firm in adhering to safe rules for your own protection, is a difficult thing to do; yet it can be done. A correct start saves often misunderstandings, which are to be avoided by all means. It is a great mistake to have serious differences with your patrons; you must remember that great consideration is due to your sitter. Perhaps you sometimes sit yourself and find you are whimsical and exacting; you like to try again for some reason you can't quite explain. Perhaps when you go to your tailor you are not at once suited with the fit or hang of your coat; his telling you it is all right does not quite convince. Remember these things and be patient; you can make another sitting as quickly as you can make an argument. The sitting would perhaps convince them, your argument would not. Make your prices sufficiently high to justify the use of a number of plates, and a half hour's time if necessary. You can afford this occasionally. If the exactions of your sitter be too great, you are entitled to charge for extra service; state it pleasantly but firmly; sugar-coat your words where the subject is disagreeable.

It is the good-natured fellows who can't say no, and who, in their anxiety to please the dear ladies, get most imposed upon.

It is not an uncommon thing for a lady to have a dozen dresses and as many toilettes photographed before an order is given to finish. She gratifies her curiosity as to how they will take, and the more sittings she has, the more undecided she is which to order. Is the lady to blame? By no means; the man has helped her to impose upon him, and is helping to establish the custom of having his neighbours imposed upon also.

I believe it entirely fair to make for all sitters two good negatives, differing in position, that they may have a choice. If they desire more plates used, it is very proper they be required to pay extra for them; particularly should sitters be made to understand a change of dress or toilette means an extra charge for new sittings.

Never put off the securing of an order for another time; clinch it on the spot. It is never too late in the day to make a sitting—that is, to take a man's order for a sitting. Many a time have I written orders for sittings by gaslight, and given my client into the hands of the operator. With his money in the till he is sure to come for his proof in the morning, and well satisfied to try again on learning last night's effort was not entirely a success. Had I told him it was too late in the day, and advised his coming again, I should probably not have seen him more. With a desire for sitting while his mind was upon it he would probably try my next door neighbour, who, with more enterprise than I had shown, would gobble him.

The time to take money is before the sitter goes into the operating room; particularly should this apply to strangers and parties regarded doubtful. All photographers who fail in this important rule are practising an injustice upon themselves Prices for photographs have become greatly demoralized. Many of our prominent and good men have been led or driven—I might say "clubbed"—into this great wrong. I will venture to assert that four in every five who have fallen into low prices are ashamed of it, and would be glad to get back to more respectable figures and a more respectable standing among their fellows. Low prices are in every way degrading, the work is carelessly made, the standard of excellence is lowered—in fact, is lost; ambition sinks to indifference, enthusiasm is killed. The work becomes drudgery, devoid of interest or pleasure.

SHORT *VERSUS* LONG WASHING FOR PRINTS.

BY H. T. ANTHONY.

Extract from the Proceedings of the London and Provincial Photographic Association.—A short discussion took place as to the very divergent opinions that had recently been expressed with regard to a long washing of prints as an element of permanency.

Mr. Debenham believed that a long stay in the water was apt to cause fading—probably induced by the partial decomposition of the sizing of the paper. He had observed that prints left washing from Saturday to Monday commonly looked weaker than those which had only been in the water for a few hours.

The experience of the writer has been such as to confirm him in the belief that long washing after fixing is very injurious to the prints in every way. He was at one time in the habit of washing his prints all night in running water. Upon changing to a shorter washing (viz., three hours in running water), he found not only that the hypo was entirely eliminated, but that the brilliancy was much greater, and the prints when mounted had an entirely different appearance. Subsequent experiments led to the understanding of the cause of this trouble, and the writer would recommend the soaking of the prints, before toning, in a very weak solution of hydrochloric acid as a specific against his troubles as well as against blisters. In all cases, however, it is presupposed that the paper has been fumed with ammonia before printing.

Subjecting silver prints not fumed to the action of muriatic acid would only interfere very materially with the toning. In such cases muriatic acid should be applied after toning, and the acidity thoroughly neutralized before fixing.—*Anthony's Bulletin.*

PHOTOGRAPHING ON WOOD.

Prepare the surface of the block by rubbing thoroughly with pumice stone. Then whiten it with flake white, rubbing it on evenly with the ball of the hand or a fine brush. Let it dry thoroughly. Now coat the block with salted albumen according to the formula given below, flowing it like collodion. Use a glass stirring rod to distribute the albumen evenly on the block, being careful not to let the rod touch the block. When evenly coated, stand the block on edge on a piece of blotting-paper to drain and dry. Repeat this coating operation two or three times, letting the block dry thoroughly between each. (This part of the process may be conducted in full daylight.) Silver the block (when quite dry after last coating) in the dark room with plain nitrate of silver solution, forty grains to the ounce. This should be done in the same manner as the albumenizing, viz., by flowing and using glass stirring rod. When dry, fume with liq. ammonia ten minutes.

Now place the negative on the block, either in a printing-frame made for the purpose, or by clamping it with wooden clamps. Expose to light from five to thirty minutes according to density of negative and intensity of light. Print rather fully, as it bleaches a little in fixing. If you use clamps, scratch the negative in some unimportant place, so that you may watch the progress of the print. (The special frames made for this purpose permit of opening for examination as in ordinary printing on paper.) When sufficiently printed, it is ready for toning and fixing; toning, however, is entirely unnecessary. Wash the block, and fix in hypo about ten minutes. Wash again thoroughly, stand on edge to dry, and block is ready for engraving.

Albumen Solution.—White of an egg beaten to a froth; let settle; then pour liquid part into a bottle, add double the quantity of water, also fifteen grains chloride of sodium and two drops liq. ammonia.

Silver Solution.

Crystallized nitrate of silver ...	... 1 ounce
Water	... 12 ounces

Fixing Solution.

Hyposulphite of soda	... 1 ounce
Water	... 6 ounces

—*Photography.*

Correspondence.

PHOTO-MICROGRAPHY, AND THE POTASH DEVELOPER.

Sir,—No. 1,355 of the Photographic News contains, under the signature J. H. Jennings, articles on the above subjects.

The former process, although little practised by the professional photographer, is of extreme value to the scientist, and pictures thus produced must ultimately displace all hand-drawn representations of microscopic objects.

For this reason the article in question is of interest to all photographers, since many who are slack during the winter months might find plenty of employment if they were able to produce good photo-micrographs for histologists, botanists, and others to be exhibited with the lantern, &c. Mr. Jennings' observations on the subject are so good, generally, that I am delighted to be able to testify to the correctness of his remarks with reference to the necessity of a choice in the nature of mounts, and a knowledge both of microscopy and of photography. Mr. Jennings' reference to oblique lighting and dark ground illumination, as giving unsatisfactory results generally, is quite in accordance with my experience; nay, I will go further, and say that pictures produced by the oblique lighting are generally illusory in proportion as the obliquity of the light increases.

There is one point, however, at which I must take exception—and that is, the strong condemnation of the French lenses, properly known as "triplets." Now, apart from the question of price (and this *is* a consideration to many a beginner), there is no doubt that very many of the French triplet quarter-inch objectives, which are to be had retail for 9s., are far better, for general photo-micrographic work, than objectives by English makers at ten times the price. I say this fearlessly, having had over twenty years' practical experience in the subject.* The reason for this is not that the English lenses are *worse* for microscopic work, but because English lenses, as a rule, have such very short working distances, and such very limited *penetration.*

Per contra, these French triplets have a very fair working distance. For example, the ¼ o. g. gives really about a quarter of an inch space between the object and the lens itself, and this is of the highest importance in focussing on the screen. The magnifying power of these quarters is generally about 200 diameters with the A eye-piece, and the penetrative qualities are very great. Comparing this with a ¼ o. g. by a leading English maker, I find that this latter comes down to within $\frac{1}{16}$ inch of the covering glass, and that $\frac{1}{100}$ of a revolution of the fine adjustment throws the image perceptibly out of focus. Hence, while with the former I can get a really good photograph of a fly's proboscis, showing both the upper and the under surface of the spiral tubes, with the latter I cannot get a decent picture of this object at all, stop it down as I may; though this objective resolves *P. angulatum* quite easily, which the French o. b. will not do at all.

I say this not for the sake of finding fault with Mr. Jennings' article, but because I would not have the beginner checked in his attempts by supposing that an expensive objective is at all necessary, or even desirable. It is, however, necessary to notice that the French objectives are generally sent out with their own eye-pieces; and the corrections, both for chromatic and spherical aberration, are best corrected when they are used together.

A short paper on the best mode of using a cheap French microscope (such as can be bought retail for about 30s.) will be found in the Year-Book for 1876, page 54, *et seq.*

I now pass on to the article headed "The Potash Developer," and would ask Mr. Jennings:—1. Why he discarded the oxalate developer? 2. In what way did the ammonia affect his health?

This latter question I look upon as most important, as so many are using (in England, at least) the ammoniacal pyro developer.

Personally, I have never found any inconvenience from its use. I have, however, discarded the use of pyro developer, as I found it much less under control than the ferrous oxalate, and for my special purpose—viz., photo-micography—very much less suited, as the grain of the deposit is much coarser in the case of pyro than in that of the ferrous salt.

Collodion, however, is far superior to gelatine for the production of such pictures, the structure being much less visible.

S. Bottone.

* I enclose specimen photographs taken with a French triplet, and shall be glad to photograph any microscopic object, with the said lens, in Mr. Jennings' presence, if he will honour me with a call.

Proceedings of Societies.

Photographic Society of Great Britain.

A meeting was held in the Committee Room attached to the Gallery, 5a, Pall Mall East, on Tuesday evening last, Mr. W. England in the chair.

Mr. Cowan exhibited his arrangement for making an adjustable diaphragm to any required standard; but as this apparatus was shown some weeks previously at a meeting of the London and Provincial Association, we need do no more than refer to our report of that meeting (p. 510), where a drawing of the apparatus will be found.

Our readers will remember that the apertures in Mr. Cowan's shutter are rectangular, and when it was first exhibited, Mr. Debenham contended that it was very desirable they should be round; and at this meeting he again raised the question as to the effect of the rectangular shape.

Mr. Cowan, however, thought that better definition in the corners might result from the use of the square openings.

The conversation then drifted into flare spots and their cause, and—

Mr. Snow mentioned an instance in which a doublet that gave a decided flare spot had been found to work satisfactorily when a black patch was placed on the central portion of the front combination.

The Chairman pointed out that secondary images formed by minute apertures in the front of the camera were frequently mistaken for true flare images.

Mr. Debenham now suggested that it would be an excellent plan to fully elucidate the question as to whether the exposures usually given to gelatine plates (something approximating to the minimum) were in reality best; and he pointed out that on a

recent occasion the Baron de Kousoff had exhibited an exceptionally fine series of interiors, representing the Czar's Palace at Moscow, and it was stated that at first it was thought the plates had been extremely over-exposed; but by pre-treatment with a strong solution of bromide of potassium, unusually well graduated pictures had been obtained; indeed, pictures with much of what is known as a "wet plate character." These results led Mr. Debenham to ask whether a long exposure and restrained or slow development might not be desirable in many cases.

Mr. Ashman said that such a course would involve much expenditure of time in development.

Mr. F. Cobb said that in his hands a plate which had been very much over-exposed by accident gave a good result when restrained.

The Chairman remarked that dilution of the developer with water gave a considerable power of control in dealing with over-exposed plates.

Mr. Ashman now called attention to the value of isochromatic plates, and referred to the experiments he had described at the last meeting of the London and Provincial Association (see p. 542.) He had used an alcoholic extract of turmeric (according to the instructions of Dr. Lohse), and had obtained good results; the blue being subdued, the yellow and red prominent. Extract of marigold flowers also answers well.

Mr. Shew exhibited a folding bracket, to be placed between camera and stand, and so arranged as to enable the camera to be readily shifted from a horizontal to a vertical position.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 21st inst., Mr. G. Waltenberg in the chair.

The Secretary read a communication received from Mr. F. H. Davis, editor of *Photography*, requesting detailed notes of the Society's proceedings; it was also mentioned that Mr. A. L. Henderson had demonstrated the cold emulsification process before the Chicago Society.

The question-box was then opened, and the following read and discussed:—"Where can silver, or electro-silver wire gauze, suitable for threading gelatine emulsion, be obtained?"

Mr. W. E. Debenham had tried several times to purchase some, but was unable to get it.

The Secretary remembered Mr. Henderson exhibiting some, sent by Prof. Stebbing from Paris.

Mr. A. Cowan recommended the querist to weave some on pins; there would be no difficulty in making a mesh from one-eighth to one-sixteenth of an inch.

Mr. J. Barker had experienced great difficulty in trying to weave a piece, and had given it up.

Mr. A. Haddon did not think weaving necessary; if a number of wires were secured on pins driven into pieces of wood crossing each other, it would be found to answer. He used a brass tube, closed at one end, and pierced with a number of holes; by means of a piston he could force the emulsion through without any difficulty. Several spoke in favour of mosquito netting, and some preferred the ordinary copper wire gauze.

Reference was then made to a recent communication recommending the employment of sulphite of soda in conjunction with mercurial intensification for gelatine plates.

Mr. Ashman said the printing quality obtained was excellent, and well worthy an extended trial. A similar effect could be obtained with ordinary washing soda if a little sulphurous acid were added.

Mr. A. Cowan had tried sulphite of soda after the mercury, and was well satisfied with the result. They required very little washing afterwards, which was a matter of some importance.

Mr. Debenham wished to know if these intensified negatives altered by exposure to light.

Mr. Ashman replied that he had exposed negatives so treated to sunlight for two days, without perceptible change.

In reference to Mr. Debenham's suggestion for testing transparencies from the same negative by various processes, examples by the following were promised:—Carbon, gelatino-bromide, gelatino-chloride, gelatino-citro-chloride, uranium (Col. Stuart Wortley's formula), wet collodion, and a modification of wet collodion. The negatives to be selected by the Curator, and three transparencies of varying depth to be produced by each member with his particular process.

Another question being found in the box, was read as follows:—"What is an optician's horse; has it a saddle: if so, when you get a lens in it how is it to be tested?"

Mr. Debenham said an optician's horse was a contrivance of wood, made of two upright boards notched, and sliding in grooves on a horizontal board; being V-shaped, whatever sized lens was dropped into it, always took a vertical plane.

A conversation then took place on the value of various colouring matters incorporated with bromide of silver, as suggested by Vogel and others, for obtaining photographs of colours in their true value.

Mr. Ashman had made some experiments with alcoholic extracts of marigold flowers, turmeric root, &c., and spoke favourably of the former. He preferred flooding the dry plate with the tincture without the addition of ammonia, and exposing in the moist state. This in no way interfered with the developer, but slightly slowed the plate. It was thought that a suitable addition of some such substance to an emulsion would prove valuable.

Talk in the Studio.

Instantaneous Views on the Hudson River.—Mr. F. C. Beach, of New York, has been successful in producing some remarkably fine views of river scenery on the Hudson with no other exposing apparatus than the ordinary lens cap. One picture, including a schooner off West Point, is of especial interest, as showing a very remarkable effect of light on the ripple of the water.

Heliograph Signalling between London and Portsmouth.—Arrangements have been made by Major Thrupp, Inspecter of Army Signalling, to place London and Wimbledom in communication with the Spithead forts by day and night for three days this week; the general idea on which the experiments are to be carried out being, that an enemy having landed on the South Coast and intercepted telegraphic communication between Portsmouth, London, and Aldershot, communication has to be maintained by signalling, by means of flags and the heliograph by day, and by night with the flashing-lamp. The stations will be Wimbledon to Epsom Downs, eight miles; Epsom Downs to Merrow Downs, near Guildford, thirteen miles; Merrow Downs to Hungry-hill, twelve miles; Hungry-hill to Hind Head, ten miles; Hind Head to Butser-hill, near Petersfield, fourteen miles; and Butser-hill to the Spithead Forts, fourteen miles. To enable practice to be made at longer distances, Merrow Down and Hind Head will be cut out for a time, so that the messages will go from Wimbledon to Epsom, Epsom to Hungry-hill, Hungry-hill to Butser-hill, and Butser-hill to the Spithead Forts, thus giving two distances of over twenty miles. During the experiments, the new Aldershot pattern lime-light will be tested.

Respiration of Leaves in the Dark. By G. Bonnier and L. Mangin (*Compt. Rend.*, 98, 1064—1067).—Comparative experiments respecting the oxygen absorbed and the carbonic anhydride evolved in the dark by the leaves of various species of plants show that the ratio between these two quantities is constant, whatever the temperature; and although the amount of carbonic anhydride evolved increases rapidly with the temperature, the amount of oxygen absorbed increases in exactly the same proportion. The ratio is approximately unity for certain species, *e.g.*, *Euonymus japonicus*, *Æsculus hippocastanum*, whilst for other species, *e.g.*, *Pinus pinaster*, it is considerably less than unity. The authors have previously shown that the ratio between the carbonic anhydride evolved and the oxygen absorbed is independent of the pressure of the oxygen, and of the proportion of carbonic anhydride in the surrounding atmosphere, and it is evident that these two processes of absorption and evolution are most intimately connected.—*Journal of the Chemical Society.*

Removal of Silver Stains from the Liebig Memorial Statue at Munich.—On November 6th, 1883, it was found that the marble statue of Liebig was covered with a number of black spots and stripes. Further examination showed these stains to consist of a mixture of silver and a little hydrated manganese dioxide. From this it is very probable that the liquid employed to deface the statue was a solution of silver nitrate and potassium permanganate. The method employed for the removal of the stains was founded on the conversion of the metals into sulphides, and subsequent solution of the sulphides by means of potassium cyanide. Each stain was covered with a paste made of yellow ammonium sulphide and porcelain clay. This was renewed after 24 hours, and after the lapse of another day carefully washed off,

and each stain then treated twice in succession with a paste of porcelain clay and concentrated solution of potassium cyanide. In most cases this was sufficient to remove all stain, but some few of the very deep stripes had to be treated in this way several times to effect complete removal. The success of the operation was so complete, that no sign of the stains can be seen now.—*Journal of the Chemical Society.*

Tempered Glass.—It is not very long since the discovery of M. Alfred de la Bastie filled all our newspapers with paragraphs, more or less ridiculous, about the properties of this glass. Some claimed it was malleable; others that it could not be broken. In fact, tempered glass was called upon to supersede all other materials. The excitement being over, tempered glass may now take its rank among valuable inventions, subject, however, to many defects in its present state. The process of tempering glass, as is well known, consists in heating a piece of glass, say a window pane, to such a degree as to approach malleability, but not hot enough to lose its shape; the glass in this state is instantly plunged into a bath composed of fatty and resinous matter, which is heated and maintained liquid at a temperature ranging from 300° to 600°, according to the quality of the glass. M. Siemens, of Dresden, says that the strength of glass is increased fifty times by being tempered. Tempered glass seems to be less dense than ordinary glass; it is harder, however, and is more difficult to cut by the diamond and tempered tools; it also possesses a much superior elasticity over the ordinary glass. Since tempered glass, however, cannot be cut with the diamond without flying to pieces, its use must necessarily be limited to definite sizes not requiring to be modified; this is quite a drawback to its use. It would seem, however, that some of the defects have already been overcome, for at the Paris Exposition quite a display of tempered goods was made by the *Société Anonyme du Verre Trempé*, of Paris. Among other things was quite a display of druggist's and chemical glassware, mortars, pestles, beakers, covered bowls, funnels; also a variety of plain and cut glass tumblers, goblets, decanters, globes, and chimneys; opal plates; a depolished bowl with cut facets; coloured glass, engraved, cut, &c. It is said that the making of articles varying in thickness is hazardous, as many of them are apt to fly to pieces either in the making or cutting.—*Scientific American.*

Photographic Club.—At the meeting on September 3rd, the subject for Discussion will be on "The Effect of Different Alkalines in the development of Gelatine Plates," with demonstration. Saturday afternoon outing at Hale End, leaving Liverpool Street at 2.2.

To Correspondents.

*** We cannot undertake to return rejected communications.

F. A. K.—1. You will find the rates for advertisements at the end of each number. 2. The pictures you send are very good, and if they represent your ordinary work, you should have no difficulty in getting such a situation as you desire.

Camera.—You can certainly register the designs, and so thoroughly protect any artistic merits they may possess; but your notion of securing to yourself the sole right of using a photograph in the way proposed would be untenable, even if the idea were original. It is a curious circumstance that we have many letters from persons who have a desire to protect the same "idea."

C. E. G.—Nothing is equal to the asphaltum mixture for backing plates, this method of working having been suggested in the Photographic News, July 2, 1880, and since almost universally adopted for astronomical work. The best way is to use ordinary Brunswick black, or the so-called Bates' black, and to scrape it off when the negative is finished, or, if preferred, before development. If you prepare a varnish yourself, dissolve bitumen in benzole, so as to obtain a varnish of a syrupy consistency. Fol's backing sheets (see Formulary) are very useful, but not so effectual as the bitumen varnish.

J. Holme.—The following formula is excellent, and you will find it easy to apply the mixture with a broad camel's hair brush, if the paper is very slightly damped and laid evenly on a slab of plate glass:—

Gum-arabic	2½ ounces
Water	12 ,,

dissolve, and add—

Bichromate of ammonia	1 ounce
Water	10 ounces

A highly sized and hard paper, like hank-post, is best.

E. H Rhodes.—Write to the gentleman named, care of Messrs. Ross and Co., Opticians, 112, New Bond Street.

Blundering Amateur.—The largest opening, or that when there is no stop, is $\frac{f}{8}$, or No. 4 according to the standard of the Photographic Society. A stop half-an-inch in diameter will be No. 16, one a quarter-of-inch in diameter will be No. 64, and one an eighth-of-an-inch will be No. 256.

J. and A. G. Hopkins.—The apparatus is very ingenious, and we are pleased to have had an opportunity of seeing it. It has been returned by Parcels' Post.

G. S.—Use will be made of your communication in the course of a few weeks. Thanks.

George Fuller.—The minute black specks are due, in our opinion, to careless straining of the emulsion; but we can trace a few spots which appear to arise from the settling of dust on the moist film.

G. Chiriet.—We will communicate with you by post.

E. Dickinson.—There are several firms who undertake such work, and the addresses can be gathered from our advertising columns.

Sulphurous.—Sulphurous acid is a gaseous body, and but slightly soluble in water. In the directions given, the aqueous solution is intended; and although this can be obtained from the operative chemists in London, it seems scarcely worth buying, as it is nearly all water, and soon deteriorates by keeping. Next week we will describe an easy way of preparing the aqueous solution.

Ardent Amateur.—Although your picture has merits, it has also faults; and as you request us to say the worst possible about it, we will proceed. In the first place, the definition is bad all over, this being, perhaps, due to fault in the lens, but more likely to careless focussing, or to the fact of the ground glass and the sensitive film not registering into the same plane (see page 470 of the present volume for a means of testing). Another serious fault is the fact that the building appears to be tumbling over, a result of the camera not being level. You might also be more careful as regards handling the plates, for finger-marks appear in several places.

Beginner.—Our "Practical Papers for Beginners" were commenced in our issue of July 18th, and all the numbers are in print at present.

N. B. B.—We have never worked with the lens you mention, but it is spoken well of in the country where it is manufactured; still we do not think it has any advantage over the instruments made in this country.

W. A. Schofield.—We have no means whatever of knowing whether the photograph is copyright, or, indeed, of finding out whose production it is, and it is therefore impossible for us to advise you as to whether you can safely reproduce it.

Paris.—Dilute albumen with ten times its bulk of water, taking care to beat or agitate the mixture very thoroughly, and use this as a substratum.

Inquirer.—Considering it is a subject upon which good authorities hold different opinions, you are unreasonable in asking us to "say definitely."

G. L. B.—An alcoholic solution of aurine—about fifty grains to the ounce.

The Photographic News Registry.

Employment Wanted.

General Assistant.—B. W., 52, Victoria-st., Wolverhampton.
Retoucher & Colourist.—Miss Harding, 45, Ceylon-place, Eastbourne.
Operator & Retoucher, &c.—Tax, *Photo. News* Office.
Operator, Printer, & Toner.—J. S., *Photo. News* Office.
Reception Room (Learner).—A B., 6, Duke-st., Manchester-sq., W.
Recep.-room, Spotting, &c.—Miss T., 126, The Grove, Stratford, Essex.
Recep.-room, Colourist, &c.—F. G., Florence House, P. of Wales-rd.
Assistant Operator.—G. N., 45, Ladbroke-grove, Notting Hill Gate.

Employment Offered.

Heliotype Printer for Australia.—Publishers, *Photo. News* Office.
Printer & Assistant.—A. B. C., 217, Brecknock-rd., Junction-rd., London.
Lady, to learn Spotting.—E. Smith, 3, Cheapside, E.C.
Reception-Room, Mounting, & Spotting.—W. J. Suter, Cheltenham.
Operator & Retoucher.—R. Cox, 37, White Ladies'-rd., Clifton.
Printer, at once.—S. Ayers, Regent-road, Great Yarmouth.

The Photographic News.

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Advertisements should be forwarded (prepaid) to Piper and Carter, 5, Castle Street, Holborn, E.C., to reach the office not later than noon on Thursday. A fee of 6d. must be forwarded when the Publishers are expected to receive and forward replies to Advertisements.

DR LOHSE, POTSDAM, COPYRIGHT

THE SUN.

Photographed at Potsdam Observatory 13TH October, 1883
$2^h.\ 43^m$ p.m. Berlin mean solar time.

(THE HORIZONTAL LINE IS MERELY THE SPIDER THREAD OF THE TELESCOPE)

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1357.—*September 5, 1884.*

LIBRARY

CONTENTS.

HELIO-CHROMIC TYPOGRAPHY BY THE METHOD OF IVES.

MR. IVES forwards us an interesting reproduction of a chromo-lithograph, printed in three colours from three blocks, and the result is such as to indicate that the method may ultimately become one of commercial importance.

The specimen is, it appears, the result of some early experiments, and is dated August, 1881. We can best describe the method of production by quoting Mr. Ives' own words. He says:—"This is printed from three plates, produced entirely by photography. One is printed with red ink, one with yellow, and the other with blue, each putting down the colour exactly where it belongs, and in almost exactly the correct proportion. If the lining of the plates had been finer, and the inks of purer and more transparent colour, the result would have been almost perfect. The negatives were made with bromide emulsion, treated with chlorophyl, eosine, and tannin, and exposed through coloured screens to distinguish the colours. The theory is not new, but the details of working are; and the result is remarkable, as being the first practical demonstration of the possibility of securing photo-mechanical reproductions in natural colour for the printing press."

We have seen chromo-typographic prints from photo-type blocks; the colours were not, as far as we know, mapped out, or distinguished by an automatic agency as in Mr. Ives' production; but a number of identical plates were made, one for each colour, and those parts which were not required to print were cut away by the tools of the engraver. Another method—which, in reality, amounts to the same thing—consists in making several identical negatives, and blocking or masking them out, so that each one shall correspond to one particular colour. A series of blocks is then prepared from the negatives so treated, and the colours are then printed in succession from the blocks.

Mr. Ives has, by his method of translating the Woodbury relief into a grain or stipple, adapted for the making of typographic blocks, made a decided step in advance, and his method bids fair to become of considerable commercial importance. Our supplement this week may be fairly taken as representing the point of perfection to which photo-block printing has arrived at present. May we hope that some future development of Mr. Ives' process may one day render it possible to produce equally good reproductions in colour?

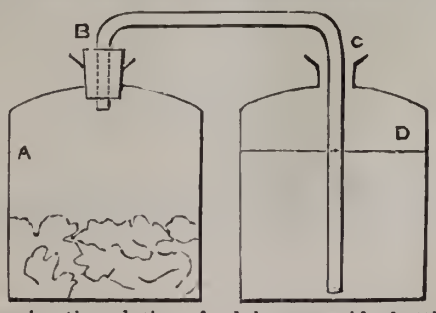
PREPARATION OF A SOLUTION OF SULPHUROUS ACID FOR PHOTOGRAPHIC PURPOSES.

ALTHOUGH an aqueous solution of sulphurous acid gas can be obtained under exceptional circumstances from the operative chemist, it is far more convenient to prepare it oneself just as it is required for use, for, once made, it is very liable to become weaker, not only on account of its tendency to absorb oxygen, and so become sulphuric acid, but also from the escape of the dissolved gas. Now that it has been recommended to use sulphurous acid in the composition of the developer, we have had several enquiries as to the best means of obtaining it, and we therefore propose now to explain how an aqueous solution of the gas may readily be prepared.

We may remind our readers that the pungent gas which is evolved when sulphur burns in the air is sulphurous acid (or rather, as it should be more systematically called, sulphurous anhydride). Still it is by no means convenient to prepare the gas by burning sulphur in the air; neither are the methods usually adopted in the laboratory those best adapted to the needs of the photographer in ordinary cases. It is, indeed, possible to purchase the pure acid condensed to a liquid in strong glass vessels like the so-called syphons used for aërated waters, Messrs. Boake, of Mile End, having introduced it into commerce in this form for the convenience of manufactures; but it is scarcely necessary to say a word as to the risk which would be incurred from inexperienced persons handling such vessels of the condensed gas.

When sulphuric acid—best diluted with twice its bulk of water—is made to react on the so-called sodium hyposulphite (or more correctly, thio-sulphate), sulphurous acid gas is evolved in abundance, and if the decomposition be effected in a suitable bottle provided with a cork and delivering tube, the gas may be easily passed into water, so as to produce a saturated solution.

Two bottles fitted up as represented below serve very well



for preparing the solution of sulphurous acid; bottles containing about one pint being a convenient size. To one of the bottles, A, is adapted a well-fitting cork, and a hole large enough to fit the glass tube, B C, is made by means of a rats-tail file; the hole being made rather too small in the first instance, and filed out to the exact size afterwards. The glass tube is cut off to the required length by making

a deep scratch with the edge of a three-cornered file, and straining it at the scratched part, when it will generally break off with a clean edge. Bending the tube is very easy, as if held in the upper part of an ordinary fish-tail gas burner, it will become sufficiently soft to yield to a very moderate pressure. Having fitted up the apparatus, about two ounces of hypo are placed in the bottle A, while the bottle B is about three-fourths filled with water—distilled water is perhaps to be preferred. Some sulphuric acid is now diluted with about twice its bulk of water, by first putting the water in an earthenware basin, and pouring in the acid as a steady stream, stirring meanwhile. If the basin is placed in the sink, no harm will be done should the heat produced by the dilution be sufficient to break it; and when cold, the diluted acid may be stored in a bottle.

The cork which serves to adapt the bent tube to the bottle, A is now just removed for an instant, the other end remaining in the water contained in D, and about two or three ounces of the dilute acid are poured in upon the hyposulphite, after which the cork is immediately replaced. Sulphurous acid is now evolved by the action of the acid on the hypo, and as the gas is generated it is led, as a series of bubbles, through the water in the second bottle. The upper part of the vessel—that is to say, the portion not occupied by the water—soon becomes filled by displacement with sulphurous acid gas, which is a little over twice as heavy as air; so in order to expedite the complete saturation of the water, it is convenient to remove the bottle A, with its tube, from the bottle D, and after having closed this latter by its cork or stopper, to agitate it thoroughly. As the sulphurous acid gas accumulated in the upper space dissolves, a partial vacuum is created, and when the stopper is eased an inrush of air may be noted. When, after passing fresh gas through the liquid for some minutes, no further inrush of air is noted on easing the stopper after closing the bottle and agitating as above, it may be concluded that the water is completely saturated with sulphurous acid. It is scarcely necessary to say that fresh additions of the diluted sulphuric acid may be made to the hyposulphite in the bottle A in order to obtain a fresh supply of gas, until the whole of the hyposulphite is decomposed; after which one must of course start with a fresh charge of materials.

The solution of sulphurous acid, if preserved at all, ought to be kept in small bottles, completely filled and perfectly closed; but as it is very easy to saturate a considerable quantity of water with sulphurous acid gas in a short time, there is but little inducement to use a solution which may possibly have become weakened by keeping.

Care should be taken not to add so much sulphuric acid at a time to the hyposulphite as to occasion any risk of the contents of the vessel A partially frothing over by the violence of the effervescence.

In preparing the sulphurous acid solution, it is well to locate the apparatus on the ouside ledge of a window, or in some other situation where no inconvenience will result from the escape of the excess of sulphurous gas as it bubbles through the water.

THE NEW STUDIO AT THE NATIONAL GALLERY.

THE above phototype engraving represents the new galvanized iron building with which the frontage of the National Gallery has recently been disfigured; but so vehement has been the outcry against such a shed being erected in Trafalgar Square, that the new structure will shortly be removed; the authorities making the somewhat shallow profession that they only intended to photograph a very few pictures. The negative—a quarter-plate—was taken by Mr. G. F. Williams, and the block was made by etching one of Messrs. Sprague and Co's. *ink photo.* transfers into relief by the chemigraphic method.

ON EXPOSURES IN THE STUDIO.

The importance attached to the correct timing of an exposure in the camera is such that its influence can hardly be over-estimated, and anything which tends to secure that desirable end must necessarily prove advantageous. What is really needed is a reliable instrument which shall be capable of registering, under any conditions of light, the actinic value of the particular light employed, irrespective of its illuminating powers. It may be said that the photographic plate is in itself as good a photometer as could be desired. In a measure, this is true; but if it were admitted to be practicable to expose and develop a test negative, a serious difficulty might be presented during the period which must elapse between exposing the test negative and the exposure proper. The difficulty to which we allude is to be found in the great changeability or alteration in the photographic power of daylight, the illuminating agent we are now dealing with. The fact is well known to those on whom devolves the duty of making exposures, and it is only by long practice interspersed with many failures, that the eye becomes so trained as to enable exposures of almost any duration to be made with a fairly close approximation to correctness. Probably the day is not distant when we shall have a reliable instrument which shall quickly indicate the actinic value of the light employed; in the meantime we must be content with such adjuncts as can be found available.

For practical reasons it has been found advantageous to employ some kind of mechanism wherewith to bring about the exposure, and we have seen many devices of simple and also complicated construction to accomplish this object; but into the respective merits of each we do not now propose to enter, as many of them have already been fully described in these pages. One thing is quite certain, and that is, any shutter which is intended to be worked on the front of a studio camera—that is, in front of the objective like an ordinary cap—must be looked upon as a mistake, and for this reason: it permits the sitter to watch the whole proceedings with more or less discomfort, and when the actual exposure takes place, a certain degree of nervous excitedness is often produced which is in every way detrimental. The resulting picture suffers, and the photograper, whose aim should be to make his clients as comfortable as they would be under ordinary conditions, has not scored a success.

We noticed a convenient form of shutter recently, which appeared to us to entirely overcome any inconvenience on this score. We were informed by the photographer that it had been in use some few years, several thousand portrait negatives in wet collodion having been made with it, the sitters being unaware of the precise moment when exposure really took place. The value of such an arrangement must have been considerable, and is of a still greater importance now that gelatine plates have entirely superseded wet collodion, because, as everyone knows perfectly well, slight movements during an exposure on a slow plate do not register at all in many cases, whereas the same degree of motion recorded on a rapid plate is very apparent; therefore a shutter which is certain in its action, noiseless, and capable of performing its work in one-quarter of a second, or any longer period, is a suitable adjuct in portraiture. Much could be said on this part of the subject if space permitted, but sufficient has been indicated for the purposes of this article, and we may rest assured that business men will utilize any means tending to give pleasure to their patrons, and commercial prosperity for themselves.

The shutter just mentioned was probably one of the earliest, if not the earliest, made on the principle of two folding doors opening from and closing at the centre of the objective. It takes up little more room inside the camera than the diameter of the objective, and can be worked by a pinion or electricity.

It is as important to become acquainted with the speed of the plates to be used, as it is to have a convenient arrangement for giving the requsite exposure; and lack of such information, or the assiduous application of it, often mars what might otherwise have been a good result. Those who make their own plates have no doubt experienced a difficulty in obtaining successive batches of uniform speed, and others who use various samples of commercial plates are not always intelligently informed: such a designation as thirty, sixty, or a hundred times as rapid as wet collodion is not by any means a useful guide. There are photographers to-day having little more than a vague notion of the capabilities of a wet plate under favourable conditions, and to whom the term is at least confusing. It follows, therefore, that a ready means of ascertaining relative comparisons between plates from different batches and various sources becomes a matter of necessity. Such a means we have in the sensitometer of Mr. Leon Warnerke, which we will describe for the benefit of our younger readers.

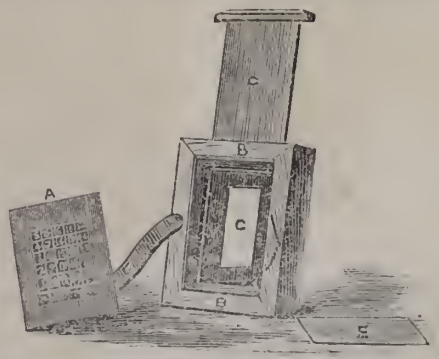
This instrument (a sketch of which is shown below) is

1	2	3	4	5
10	9	8	7	6
11	12	13	14	15
20	19	18	17	16
21	22	23	24	25

practically a series of negatives having densities varying from clear glass to the greatest opacity likely to be met with under ordinary circumstances. It is a Woodburytype print produced from several thicknesses of a semi-opaque substance, such as tissue paper or coloured gelatine of a square pattern; the number of thicknesses being progressive, a scale is thus obtained varying in opacity from one to twenty-five degrees. In the diagram, however, the gradations of tint are not shown, but only the number; still the following sketch will give an idea of the grada-

tions of the scale. Upon each square is printed in opaque pigment a number corresponding to the number of squares employed. It will be seen that plates exposed under this scale will be acted upon inversely as the number progresses; number twenty-five being the most obstructive, and therefore a reading indicative of very high sensitiveness.

In our sketch, A is the sensitometer, suitably mounted;



B the dark slide grooved; C is a phosphorescent tablet, the luminous side, when in use, being next, but not touching the sensitometer by a distance equal to about three-eighths of an inch; D is the shutter of the dark slide, which is withdrawn as in making an exposure; E is an ordinary back to exclude light from the plate from any outside

sources; F, spring, to ensure contact. The shutter being closed, the sensitometer is placed in the groove prepared for its reception (numbers upwards); the plate to be tested is placed, in contact with these numbers, in the dark-room; E is replaced, and pressure exerted by means of the spring F. The phosphorescent tablet, C, which, after being made luminous, as we shall presently describe, is placed in its receptacle, when all is ready for testing the plate.

To render the phosphorescent tablet luminous, one inch of magnesium ribbon is burnt as close as possible to the surface; the tablet is then placed in its position, and at the expiration of one minute the shutter is withdrawn, and an exposure of thirty seconds given. The plate is then developed, when certain numbers of a straw colour on a darkened ground will be seen; the highest number seen is said to be the speed of the plate. Especial care should be exercised in excluding any unsafe light from the plate previous to testing, as a non-observance of this precaution would render the test unsatisfactory.

The question of what is a correctly exposed negative has lately been brought forward as matter for consideration by the Photographic Society of Great Britain. Should it receive the attention it deserves, some tangible good will come of it; at present, opinions are somewhat divergent, which makes it invidious for us to lay down any strict lines for observance. Briefly, we may say that a correct exposure is judged by the relative degree of density existing in the opaque parts of a negative, compared with detail in the shadows. In the days of wet collodion the difficulty was to obtain sufficient detail with a reasonable exposure; but with gelatine plates it is quite the reverse. Failure is far more frequent from too much than too little exposure, and this is more often attributable to the want of uniformity in the speed of the plates than insufficient knowledge of the quality of the light. Still, it seldom happens that commercial plates from the same packet vary; thinly-coated plates are sometimes met with, which give halation and a flat-looking negative, devoid of contrast. When plates of this kind are met with, they can be made serviceable for transparencies by backing them up, previous to exposure, with a piece of carbon tissue of the same dimensions as the plate; contact is best insured by moistening the tissue with water, to which a fourth part of glycerine has been added.

It is convenient to have some kind of test for the thickness and evenness of the coating of emulsion. A tablet of printed matter answers as well as anything for the purpose, and if it be placed near the dark-room window or lamp, all plates may be examined before putting them in the dark slide. Should the printing be distinctly visible, then the plate should be put aside for use with the backing of carbon tissue.

By-the-Bye.

PHOTOGRAPHY IN SPITE OF ONESELF.

To compress Saturday morning's work into Friday is the order of things when one intends to take an over-Sunday run to a port on the other side of the Channel; while if Monday can be added to the holiday by making a little extra effort on the Tuesday and Wednesday, so much the better.

As the train which takes one from Liverpool Street for Rotterdam and Antwerp does not leave till eight o'clock, there is a good chance of doing a full day's work, with, perhaps, an extra hour or two on account of Saturday. Luggage one does not want unless a hand-bag containing a piece of soap, a tooth brush, and "Baedeker" can be called luggage. Photographic apparatus? No, indeed, not even the most portable of portable cameras, nor anything relating directly or indirectly to the dry plate; for is it not a flight from the memory of the studio and the dark room, and an attempt to forget their existence until next week's labour shall commence?

But here is Parkeston, after a two hours' ride in the train; and hesitating for a moment whether to turn off to the right in response to the invitation "this way for Rotterdam," or to go to the left on board the Antwerp boat, the latter is decided on; the fact of tickets being available to or from either place having caused a moment of hesitation. It is not long after ten when the steamer glides out of Harwich Harbour, and as it is by no means satisfactory to do without a night's rest, it is desirable to turn in and sleep until the grey of the morning stretches out from over the dimly outlined Dutch coast, as if to give a matitudinal greeting to the ship. Gradually the little red-bricked town of Flushing assumes shape in the mist, the tower giving one the idea of a pile of variously shaped beads threaded on a wire; while the old two-sailed windmill, mounted on its ancient and massive cone of masonry, seems to be labouring hard to drive away the last traces of haze and mist with its gigantic arms.

"How castaway it looks, and how out of the world!" remarks a passenger, as the steamer comes to a sudden halt, while a gleam of early morning sunshine makes the little town figure out as brightly and clearly as a lantern picture just freed from the obscuring influence of the dissolver.

Yon small boat, painted on the bows with the legend "*Pilotage d'Anvers*," has just glided away from our side, and we are now once more on the move, but this time under the charge of the Belgian pilot, who, at present, is responsible for our safety through the sixty miles or so we have to steam along the Scheldt.

The lazy and broad stream, with its dim mud-coloured banks, gradually narrows, and the banks become green, while now and then a little village of chequered red and white looks out from a break in a row of toy-like trees; but now the spire of Antwerp Cathedral, with its half-finished companion, is dimly seen.

Now it is on our right, now to the left, as each bend in the river turns our direction; but when round the final bend by the old Northern Citadel, we see the extent of the magnificent quays along the whole frontage of the city, and can notice how much this frontage has extended during the last ten years or so. Some minutes later we are on land, and trotting along nimbly in the morning sunshine towards the centre of the city, uncertain whether to stay in Antwerp, or to go to some inland town by rail; for he who neither carries photographic apparatus nor other luggage may leave such questions to be determined by the impulses of the moment. But here, at any rate, is an establishment which it is desirable to visit, as it holds out a promise of a good breakfast. A touch on the shoulder at this moment, followed by a "Hollo there!" and a turn, serves to reveal the portly form of Bridgeman, who carries a tripod stand and leather case. "You here!" he exclaims; "I am so glad, come along, and we will expose a plate on the new Scheldt Monument. How fortunate you have no luggage."

"I always like to get a few houses in with the picture of a monument," said Bridgeman, "and it will do very well if taken a little way from the corner of the square, and you may as well go and tell that policeman not to stare straight into the lens." "Ah!" he remarked, as he unfastened the camera, after having exposed, "you see that I run no risk of losing the screw, for it is fixed to the top of the stand by a few links of chain; but the last ring fits in a groove on the head, so that the screw turns easily."

Excellent and genial a fellow as Bridgeman may be under ordinary circumstances, he and his photographic apparatus are not exactly to the taste of one who is seeking to forget everything photographic for two or three days, and Bridgeman is intensely photographic just now; still, considering that he has a stock of some five or six dozen plates, which he will expose before Monday evening, it seems useless to

think of seeing the end of them and getting Bridgeman to drop the photographer and become an ordinary mortal; so after some three or four plates have been exposed, we explain that our inclinations lead us to go on to Brussels, and, perhaps, take a run to the old ruined Abbey of Villiers-la-Ville. "How very fortunate!" exclaimed our companion; "I had just concluded to go there myself, only there are a few pictures I must take at the Plantin Museum; so Brussels this evening, and Villiers in the morning!"

The fine old building which formed the printing establishment of the Plantin family does not date from the time the business was first established in 1555, but was erected by the first Plantin about twenty-five years after this time. For nearly two centuries this printing house was one of the most important in Europe.

"Screw your lens in very tight, and see that every part of the apparatus is specially rigid, when your cap may be taken off and put on several times during the exposure of one plate," said Bridgeman, as he set up his camera for a ten minutes' exposure in the dark oak-timbered gallery where many of the original designs supplied to the Plantin Printing House by Rubens are displayed in cases, and portraits by the same master hang round the walls. Many interruptions of the exposure were necessary, as whenever anyone carrying a guide-book halted in his course, it became necessary to cap the lens, as otherwise the white paper would have been tolerably certain to make an impression on the plate.

It was in the old Printing Office, or composing and press room, that Bridgeman spent most time, and, it may be added, taxed our patience to the utmost. We have here the main apartment of the establishment, one side being occupied by a row of frames and type cases, and the other by some eight of the old wooden presses, with their accompaniments of inking balls and slabs. If it had not been for a prominently-displayed notice in French and Flemish, cautioning the public not to touch anything, one might have thought that the workmen of two hundred years ago had but just left for their dinner, and would return in half-an-hour: partly set type being on the galleys and in composing sticks; while copy was on the frame, and proof-sheets on the reader's desk. "That notice must come down," said Bridgeman decidedly, pointing to the prominent caution not to touch; "it would utterly ruin everything; and do be good enough to see to it while I set the camera." This was not an easy matter, as the attendant, when first consulted, was quite sure that nothing could be done, especially as he had no screw-driver; but a little quiet conversation, during which a slight metallic jingle might have been distinguished by an attentive listener, served to convince him that there might be a possibility—in fact, that it was just possible to remove the obnoxious notice.

The extensive collection of engraved blocks and plates, together with impressions from them, are in great part displayed in vertical cases, so as to render it possible to take effective photographs of the rooms containing them.

The type foundry, with its extensive collections of original steel punches, copper matrixes, and body moulds, is arranged as if ready for work, and an inspection gives an excellent idea of the old method of casting types. The view taken of the principal work bench, with a range of melting furnaces towards the left, should make an effective picture. The magnificent library, containing, in all probability, the finest existing collection of the works of the celebrated printers of the sixteenth, seventeenth, and eighteenth centuries, was not photographed; several very learned looking personages being apparently engaged in a profound study—accompanied with occasional earnest discussion—of some of the venerable tomes; indeed, the general public are not admitted to more than a narrow strip of the great library apartment, this strip having been fenced off by wirework trellis. No one going to Antwerp should fail to visit the extensive printing house of the Plantin family, long closed, still preserved from the hands of auctioneer and salesman by a strange combination of circumstances quite romantic, but now State property, and constituted a public museum.

Bridgeman, in response to our suggestion that it was now quite time to direct our steps Brusselswards, talked of going to his hotel to change plates, and after he had recharged his slides, he must go and secure a quaint old house here, or an image of a "Virgin and Child" in a bye-street there, or try a view of the Cathedral from the far corner of the old market-place. It is only fair to admit that Bridgeman's arrangement for changing plates is ingenious, very portable, and convenient; when closed, it is somewhat like an umbrella of about half the usual length, but on unrolling the black covering, some splints or laths of wood are found, which make up a light frame, and on this is stretched the black cover, two arm-holes provided with elastic wristbands being provided. "No," said Bridgeman, "it is not safe for changing plates in full sunshine, simply because there is no necessity whatever to make it so; even now I shall pull down the blinds and cover it with my focussing-cloth."

At last we were in the train for Brussels; but Bridgeman would look at everything from a photographic point of view; and a remark of ours about Malines, as we halted there, led to our being told that the children there are remarkably troublesome to the photographer, and we learned how Bridgeman had sold them. His camera was adjusted, but he could not expose because of the troop surrounding him, so he turned his back to it, put his hands behind him in an attitude of unconcern, and asked his companion to take the leather case to a little distance, and do nothing with such an air as would convey the idea of important work. Of course, the little ones ran off to see what was being done, and the exposure was made. On another occasion, he adjusted his camera, marked the place occupied by each leg of the tripod, and retired into a neighbouring beer-house, and it was only the work of a few seconds to replace the camera and to expose when the young folks had distributed. The little station of Vieux-Dieu reminded him of a plate he had accidentally over-exposed there; but he managed to bring it round by diluting the developer very much; in fact, Bridgeman says that few persons realise the extent to which development can be controlled by simply adding water to the normal developer. When a plate shows signs of very much over-exposure, he simply pours the developer back in the glass, and fills up the dish with water, a few drops of the original developer being added as required.

Brussels at last; but the rain is falling in torrents, and of course the photographic apparatus must be left behind at the station, or the leather case will be soaked through and through; and besides, what is the use of carrying a camera about in the rain? Bridgeman, however, says nothing, but takes out his focussing-cloth—which, by-the-bye, is of mackintosh cloth with tapes fastened to it—folds this up so as to make a trough like a bread-tin, inverts it over the leather case, and ties with the tapes; a stout strap round the whole now serving to hold the shoulder straps in position. No photographing this evening, but a visit to the Eden instead; and even here Bridgeman will talk photography; he talks of exposures by the electric light, and it seems as if he muttered something about "no water required in the developer."

Next morning it rains; but despite of this, Bridgeman will take the camera; he can depend on his waterproof focussing-cloth to protect the camera, and he will be content to wait for a gleam of sunshine to make the exposure; and he does wait so patiently for his exposures that it is late in the afternoon before we leave the ruins of the grand old Cistercian Abbey—perhaps the finest of its kind in Europe—and take the footpath leading over a wooded hill to Bousval, so that we may return to Brussels by another line of railway. The rain is so heavy as to take away the enjoyment of what would otherwise be one of the most

delightful country walks in Belgium; for although one misses the ruggedness of the Ardennes districts, there is instead, the soft leafiness one is accustomed to associate with Devonshire; the bright grassy banks, lanes shaded over with light, graceful boughs, which meet at about the level of one's head; and glistening rivulets. At Bousval station the camera is brought out again; but Bridgeman has planted it right in the midst of the shunting ground, and as he sees the station-master rapidly approaching, he leaves the camera, and politely invites that functionary to stand near his office, to "give grace to the picture he is about to make." This stroke of diplomacy having converted a probable enemy into a friend, the exposure is made; but other "friends" appear and want to be immortalised, so a second exposure is made—this time with the shutter not drawn! But here is the train. Nivelles is reached—a walk from the northern station towards the eastern station, with a flying shot at the Romanesque Church on the way—another trespass on railway property, and ignominious imprisonment in a waiting room despite the blandishments of Bridgeman—Braine l'alleud, with a glance at the Waterloo Lion when the train has passed the station.—Brussels.

There has been a grand liberal demonstration (Aug. 31), and the people are as with one voice—and that is neither remarkably steady nor exceptionally tuneful—singing a dirge on an unpopular minister. The little hand-bills which are being handed round are adorned with the coffin of the unpopular Vanderpeercoom, the words and music of the dirge being printed underneath; but the little bands of soldiers who parade the streets with fixed bayonets look good-temperedly on. Curiously enough, no police are to be seen—perhaps they are in plain clothes: at anyrate, it seemed to us that the individual who started a *vive le roi* has worn a uniform and a sword. He, however, has struck a resonant chord, for the people cease singing "*O! monstre terrible*," and cheer for their king.

It is not easy to cross the city so as to reach the station from which the train for Antwerp leaves, nor is it easy either to get in the train, or to get out at Antwerp; but when out, we find ourselves to be part of a procession, marching in slow time and chanting, "*Oh! monstre terrible.*" Bridgeman, by virtue of his commanding figure and his tripod—carried like a wand of office—is, with common consent, allowed to take a prominent position.

Next morning, Bridgeman discovers that he has no more plates, so the camera is left at home—for the inn of the cosmopolitan is always his home—and we have a jovial day in the commercial capital of Belgium before boarding the steamer at 4.30 p.m. Liverpool Street Station is reached at seven the next morning, and the day's work is commenced with new spirits and energy.

Press of matter compels us to allow our "Practical Paper" (No. 6.—Taking a Portrait) to stand over until next week.

ISOCHROMATIC PLATES BY MEANS OF CHLOROPHYL.

BY FRED. E. IVES.

My method of preparing chlorophyl solution and using it for increasing the colour-sensitiveness of silver bromide plates, was published nearly five years ago in the *Philadelphia Photographer*, December, 1879; but in answer to your request, I furnish the following particulars for publication in the News.

Take fresh blue-myrtle leaves, cut them up into very small bits, and place in a florence flask. Cover with alcohol, and warm over a spirit lamp for about twenty minutes, stirring constantly, and taking care not to heat too hot, which might destroy some of the chlorophyl. The solution will be of a deep rich green colour, and will keep some weeks if tightly corked, and not exposed to light. It may also be prepared from the dried leaves by first soaking them in distilled water, but is not so good as that from the fresh leaves, and in either case a fresh solution will give the best results. I have been told that the addition of a little powdered zinc to the solution will cause it to retain its strength indefinitely, but I have not yet tried the experiment.

I believe that any good collodio-bromide emulsion will answer, but I have always used one made with a slight excess of silver, which was afterwards converted into chloride.

The plates were prepared by first flowing with the emulsion, then, as soon as it is set, covering with the chlorophyl solution for one minute. They are then washed thoroughly with pure water, and exposed in the camera while still wet, using a coloured screen in front of the lens to filter out light which would otherwise produce too much effect. As long exposures are necessary, it is often an advantage to flow the plate with glycerine, and the object to be photographed should be placed in direct sunlight when practicable.

The best screen for filtering the light is a small plate-glass tank containing a solution of bichromate of potash. If the tank is three-eighths inch between the glass, the bichromate solution may be of the strength of one grain of bichromate of potash to two ounces of water. If stronger, blues will photograph too dark, and yellow and red too light; if weaker, blues will be too light, and yellow and red too dark. If a solution of aniline red is used as a screen, the red and yellow or a highly coloured chromo-lithograph can be made to photograph almost like white, while the blue comes out black. With a green screen of a certain shade and intensity, I have made bright chromo-lithographs photograph as if almost all of the colour had been bleached out of it.

Something depends also upon the developer, some developers bringing out the colour sensitiveness more than others, or in different proportions; but so far as my experience goes, this difference is not nearly so marked with chlorophyl as with eosine plates.

It has been stated that isochromatic plates do not give a sensibly different effect from others in photographing landscapes, but this is true only when no coloured screen is employed. Some of the most striking results I have obtained were landscape photographs made with the chlorophyl plates. The effect is not only different, but so very different that everyone who sees them is astonished. I will send you prints from three landscape negatives which were made *simultaneously*—one with chlorophyl and a red screen, one with eosine and a yellow screen, and one with plain emulsion and no screen. Had I used the chlorophyl plate with a yellow screen, it would have given nearly the same result as the eosine, except that the reds would have developed stronger; but had I used the eosine plate with the red screen, it would have given no image whatever.

I have experimented with the addition of both chlorophyl and eosine to the emulsion, but have not been able to secure one-half as good results in that way as by applying them in the manner which I have described.

PS.—In the photographs which I send, note (1) the difference in foreground as compared with distance, (2) the difference in blue sky as compared with house, and (3) the difference in haystacks as compared with barns. Both of the isochromatic plates bring out a great deal more detail in the green foliage.

INCANDESCENT LAMPS AND ACCUMULATORS IN PHOTO-MICROGRAPHY.

BY FREDERICK W. MERCER, M.D., F.R.M.S.

It is but a short time since small incandescent lamps were applied to the microscope, and during this somewhat brief period the matter has received attention at the hands of a few investigators. Dr. Van Heurck, of Antwerp, was probably the first to employ incandescent lamps in this way, but they were of large size and required elaborate battery power. Mr. C. H.

Stearn, F.R.M.S., of London, originated small lamps especially adapted for this purpose, and which required a low battery power for their service. Dr. Theo. Stein, of Germany, has, in an article just published, described lamps and apparatus similar to those by Mr. Stearn, in the Journal of the Royal Microscopical Society, 1883.

Next to sunlight, the electric light is the best illuminator for photo-micrography; this assertion can be made upon the mere character of the light; but when we consider that it can be utilized day or night, in cloudy or clear weather, it gives advantages placing it nearly upon a par with sunlight itself. There are of course certain difficulties in the way of its general use, chiefly trouble and expense. Those, however, having some time and mechanical aptitude, may construct a good part of the necessary apparatus for the production of the light.

The lamps are not impossible of construction by an amateur, but as they may now be obtained at reasonable cost, it would not be well to attempt their manufacture from considerations of economy.

In the figures 2 and 3 are shown lamps made by Mawson and Swan, at Newcastle-on-Tyne. The drawing has been made nearly to exact size. The stems are of vulcanite, and contact for current is made by two slips of brass fastened to two sides of the

Fig. 1

Fig. 2.

Fig. 3.

stem; these metal strips make contact with the poles of the battery when the lamp has been pressed into its socket, which is simple in form and easily applied as an adapter to the sub-stage, or in place of the mirror, at the extremity of the mirror-bar. Fig. 3 is intended for use in the sub-stage, and may be carried close up, almost to contact, with the under surface of the object-slide. This lamp is of about $\frac{3}{4}$-candle power. The lamp at fig. 2, pressed to full incandescence, gives a light equal to nearly two candles. These lamps have a low resistance, and can be fully lighted by three large Bunsen cells. Four Leclanche cells fail to give as good results. The lamp shown in fig. 1 was made by the Edison Company, is a little larger than the Swan, has a higher resistance, and therefore requires more battery power; it is, however, very satisfactory in work, and gives a little more light than that indicated at fig. 2. The best means of illuminating these lamps is by a small and very portable accumulator made on the Faure principle. It consists of a

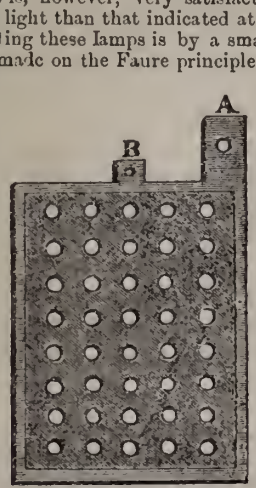


Fig. 4.

$\frac{3}{4}$-inch thick wooden box 12 inches long, 6 inches wide, and 7 inches deep, outside measure. A partition divides it in the centre, forming two cells. The joints of the box should be halved into each other, and well smeared with Canada balsam in benzol, before closing. When completed, the interior of the cells should receive four or five coats of thick asphaltum varnish, each coat being allowed to dry before applying another.

The lead plates for use in these cells should be 6 by 4½ inches, of the form shown in fig. 4, which has proved, after trying a variety of patterns, the best. The plate is made by casting in a mould, a pattern of wood having been made for that purpose. The edges and ears, A B, should be about $\frac{3}{16}$ inch thick; the surface of the plate, excepting a quarter-inch of the edge all around, should be less than $\frac{1}{8}$-inch thick; this surface is pierced by holes $\frac{5}{16}$-inch in diameter, and about the same distance apart. The ear or tag A is for connecting the plates electrically by means of a metal rod passed through the hole, a boss of lead $\frac{3}{8}$-inch, formed of small lead plate, inserted between to keep each plate apart, the whole, say eight negative or positive plates, being thus secured by means of a nut at the end of the rod. The smaller ear, B, is to secure the plate to the battery cover, through which it passes, the weight being carried by a small wooden peg passed through the hole.

The sixteen plates, eight for each cell, four —, four +, are in this way secured to the cover $\frac{3}{8}$-inch apart, and held half-an-inch clear of the bottom of the cell, to prevent short circuit through deposits formed. Plates that rest upon any portion of the bottom of the cell, or which may be connected up by means of copper wire, no matter how well protected, must prove unsatisfactory, and at last fail. The plate and its connection should be in one piece, as shown in the ear A. The holes in the lead plates, excepting those in the ears, are to be filled with a paste made of the best red lead and dilute sulphuric acid, two to five. As soon as this paste has set in the holes, the battery is ready for forming, which is done by passing reversed currents from a dynamo machine for a few days, reversing the current two or three times each day. The solution for immersing the plates should be about one of sulphuric acid to ten or twelve of water. This storage battery, once formed, can be charged or reinforced from four large Bunsen cells. Such an accumulator has positive advantages over any form of primary battery. It is small and portable, can be carried by one hand, may be taken from point to point by any conveyance. The escape of formed gas is slight and non-irritating; no offensive odours; its current is absolutely steady. The capacity for work may be stated to be a good white light from the larger lamp for a period of about three consecutive hours. This does not exhaust the charge, for the lamp can be kept at a red heat for four hours more.

In charging the battery it should not be pushed to its utmost capacity; when the plates become heated and much gas is evolved, the charge should be more slowly passed in, and the battery tested by one of the lamps for charge. In charging more than one cell they should be arranged in series and in arc, on the same principle as ordinary primary cells.

The battery should be kept clean by occasionally washing the plates under a gentle stream from the tap, the cells being thoroughly washed out. If out of use for a week or longer, the cells should be emptied and the parts washed.

In photo-micrography the lamp may be used direct—that is, without the intervention of condensers of any kind. Indeed, this may be considered a rule for all powers below $\frac{1}{6}$-inch. When used direct, the lamp should be carried pretty close to the object, a diaphragm being necessary to cut off all extraneous light. Unless the lamp has been so constructed as to bring the arch of the carbon loop at about the centre of convexity of the glass enclosing it, its direct use will not prove satisfactory; or the globe of the lamp may be flattened on two sides and aberration thus avoided. When using higher powers, the interposition of achromatic condensers will be desirable.

In photography the incandescence must be pushed to a clear white light, otherwise failure must attend every effort. The time required is a little longer than that for sunlight, the actinic power of the electric light not being as high, though the latter may give just as bright and sharp an image upon the focussing-screen. In using the lamp it is well to insert resistance in some form between the lamp and the source of energy, as the lamp may be at once destroyed through carelessly connecting it up with an unknown amount of energy. I have seen a lamp instantly burnt out by two Stöhrer medical cells, though a moment after these same two cells were so exhausted as to be unable to give sufficient current to heat the carbon film to dull redness.

The form of resistance may be either that afforded by a few feet of fine insulated wire, or by the very portable adjustable resistance coil made by Mawson and Swan. Compared with lamplight, electricity gives an intense white light having greater actinic power, consequently much shorter exposures are required.

The light can be carried close up to the object or condensers, giving advantages in sharpness of image and resolution of detail not possible by means of lamplight.

In conclusion. The accumulator will be found useful in many directions, as by means of a coil of small copper wire the stage of the microscope can be kept at an even temperature for many hours—ten or more; and it will, with fig. 1, give excellent results in printing transparencies.

Notes.

It was by the especial permission of the Czar that the Baron de Koussoff produced the photograph of the State Dining Hall of the Czar Alexis Michajlowitch, in the old palace at Moscow. This picture, which is one of our supplements this week, forms one of the first series of photographs taken in the old palace of the Czars.

Through the portal, and in the next apartment, may be seen the casket containing the original Charter of the Romanoff family; and the two large porcelain stoves, together with the double windows, serve to remind one of the coldness of the climate in winter. It was in this palace that Peter the Great was born.

How far the industrial importance of photography may become developed now that it is easy and practicable to transform photographs into types or blocks which, like ordinary wood engravings, can be printed along with the letterpress of an ordinary newspaper or magazine, it is not easy to predict; but it is not difficult to see that great results must follow the production of such photo-engravings as those by the Ives' process, which form our second supplement this week..

The Ives prints are impressions from a type block, and the production of this block depends upon the translation of the gradations in thickness of a Woodbury relief into a grain by pressure against a stippled surface, the stippled image being transferred to zinc and etched into relief by the ordinary chemigraphic method. (See PHOTOGRAPHIC NEWS 1883, p. 498-677; 1884, p. 222-324; and for details of chemigraphic engraving, a series of articles commencing on p. 673 of our volume for 1882.)

The time may come when the Ives process for translating a relief into a grain may be regarded as being a definite step in advance comparable to that made by Talbot when he introduced the system of multiplying photographs by means of a negative.

There have been few more ingenious modes of setting a fashion than that adopted by the patentees of a new shape in "masher" collars. The plan has been to take all the well known society "heads"—in a photographic as well as in a social sense—and having "fitted on" the collar pictorially, and added a coat and shirt-front, to photograph the whole. When the "masher" sees photographs in the hosiers' windows of Lord Randolph Churchill, Colonel Burnaby, Lord Charles Beresford, Mr. Henry Irving, and any number of other well known celebrities wearing this particular collar, the inference is irresistible. He musn't be behind the times, and so he immediately arrays himself in the new shape.

The general International Exhibition at Antwerp, which opens in May next, will probably comprise an extensive collection of photographic exhibits, and space must be applied for before the fifteenth of next month.

A waxed paper negative may be retouched with water-colours, if the surface be treated with ox-gall, or if the colours are rubbed up with the same material. Waxed-paper negatives are very useful for printing-in borders or clouds, and there is no need to make them by the old wax paper process, as an impression from a transparency taken on ordinary albumenized paper answers well; but before waxing, it is as well to soak the sheet in hot water, so as to remove as much of the sizing as possible.

It is satisfactory to know that the "Antients" of Barnard's Inn, who lately presented half-a-dozen portraits of legal luminaries, including a capital likeness of the great Lord Burleigh, to the National Portrait Gallery, had photographs of the interior of their Hall taken with the said pictures on the walls before sending them off to Mr. George Scharf.

Few people, probably, have ever been inside the quaint old oak wainscoted room in question; there are not many, indeed, who even know where Barnard's Inn is; and as the "Antients'" action in getting rid of their artistic portable property points apparently to a not very distant day when Barnard (as Mr. H. J. Byron once put it) will be "Inn" no longer, it is well that photographic record should remain of the "Hall" where, for several centuries past, the "Antients" have dined together at monthly intervals, and hob-nobbed over that fine old port to which they have consistently stuck. Come what may, "Barnard's Inn" will not be forgotten whilst "Great Expectations" is read; but it is nevertheless just as well to have some reminiscences of it more tangible than those which, thanks to Dickens's art, will always be associated with the Inn in which "Pip" had chambers with Herbert Pocket, and whither the weird "Convict" came in the darkness to endow him with his mysterious wealth.

As regards the British Association at Montreal, nothing of special interest to our readers transpired excepting what we recorded last week. The session closed last Wednesday.

A correspondent, writing with reference to our recent remarks on the "scissorgraphic" art, assures us that at Portsmouth, at all events, there is no immediate chance of its dying out. A local "silhouettist," rejoicing in the somewhat familiar appellation of "Snips," is said to be great with the scissors, his facility in equestrian portraits especially being most marked. Officers and men of the Royal Navy, it is said, are his frequent patrons, "Jack

ashore" being particularly fond of being cut out "on board" a jabbed charger. "Snips" would seem, indeed, like many other anachronisms, to be the source of considerable interest, though we still fail to see that his local survival is a proof that the state of "scissorgraphy" is not as black as we painted it.

A society journal announces the welcome intelligence that the hideous iron shed in front of the National Gallery will be shortly removed, as the work for which it was erected will soon be completed. The journal in question says that a "German photographer" has been in occupation. A phototype print of the structure will be found on page 562.

A filter which consists merely of a strainer so fine as to remove the minutest microbes appears to be regarded by M. Pasteur as likely to prove of more value for domestic purposes than a charcoal filter; and he has constructed one in which the filtering medium is ordinary porous earthenware, such as that used for battery cells. The extreme slowness with which filtration takes place, and the high pressure required to drive water through the earthenware, are, however, practical objections to the apparatus.

The itinerant photographer doesn't always display tact. He has a notion that everybody who rides a bicycle or tricycle wants to be photographed; and though this notion may be well founded, common prudence should have warned the photographer who, on Clapham Common, went up to a tricyclist who had just had a spill, and was covered with mud and bruises, not to beseech him to be taken "Just as you are, sir!" We forbear printing the tricyclist's reply.

A Photographic Art Exhibition is to be held at Leeuwarden, in Holland, during the early part of next year; the opening day being fixed for February 1st, and application for space must be made to Mr. G. H. Matthijssen, Ruiters-kwartier G. 95, Leeuwarden, before the 20th of October.

It is a pity the stereoscope has gone out of fame. With the rapidity of gelatine plates, effects could now be easily secured which would look marvellously well in the stereoscope. It may be questioned, owing to the unaccommodating way in which the earlier stereoscopes were made, whether half the people who looked through them realized the stereoscopic effect. The variation in the length of focus needed to suit all eyesights would surprise anybody who had not studied the subject. In this respect the old stereoscopes were singularly deficient.

What coustitutes "fair wear and tear" of photographic apparatus? We ask the question because of a dispute between two photographers which has come to our knowledge. A certain quantity of apparatus was let on hire, the hirer being responsible for its return in good condition, "fair wear and tear" excepted. In this case one of the legs of a tripod stand has been broken, a background damaged by water dripping through the roof; and the cross-piece of the head-rest has come unsoldered. One side maintains that these were all preventible accidents, and the result of carelessness; while the other holds that they were entirely unavoidable. Common sense would seem to say that injury resulting from the legitimate use of apparatus can only be claimed as "fair wear and tear." Thus a dark slide used in the wet process must in course of time become damaged by silver; the screws of the head-rest used constantly may fail to bite; and printing-frames, through exposure, and through the rough handling of boys, are liable to be rendered useless. But even taking this as a guiding principle, the question seems a difficult one to decide.

A nearly colourless cement for glass may be with advantage kept ready to hand in the photographic laboratory, and the following has proved to be useful. Seventy parts of finely-cut unvulcanised india-rubber are dissolved in one hundred parts of chloroform, after which fifteen parts of mastic are added. It takes some days for the mastic to thoroughly dissolve, and care should be taken that the cement is made and kept in a well stoppered bottle.

An artist who has been spending his holidays abroad, showed us recently a number of photographs which he had bought, in the usual way, unmounted. These he has mounted himself on boards of different tints, observing that he had endeavoured to provide each photograph with the tint best suited to the subject and tone. This may seem a small matter, but it is wonderful how much a photograph may gain or lose according to the tint by which it is surrounded. The sending of a number of prints to a professional mounter, and having all of them mounted precisely alike, must produce, in many cases, an unsatisfactory result.

Apropos of the discussion of green *versus* ruby glass: has the experiment ever been tried of a person who is colour blind in respect to either, going into a room lighted by the colour to which he is blind? His sensations would certainly be worth describing.

Patent Intelligence.

Applications for Letters Patent.

11,623. John Tirebuck, 6, Lord Street, Liverpool, for "Improvements in albums or apparatus for holding and displaying photographs."—Dated 26th August, 1884.

11,803. Frank Bishop, 53, Chancery Lane, London, W.C., for "An improved washing trough for photographic negatives."—Dated 30th August, 1884.

Specification Published during the Week.

9899. Lorentz Albert Groth, K.G.V., Civil Engineer and Managing Director of the Universal Inventors and Patentees Financial Company Limited, 30, Finsbury Pavement, London, E.C., for "A new or improved photograph and picture stand."—Dated 8th July, 1884. *Complete Specification.*

The stand is intended for the reception of photographs, lithographs, prints, drawings, pictures, or any other flat object, and differs from other similar apparatuses principally, by enabling the objects to be be seen at the same time from different sides.

The photographs, drawings, &c., are placed one behiud the other slantingly or vertically.

In both cases, the apparatus consists of a stand and a number of picture holders or frames. The stand is made of brass, tin, or any other convenient metal, and rests on feet of any angular or any other shape that may be desired, with crosspieces answering to the shape. The picture holders or frames may also be made of brass, tin, or any other metal, or of hard wood, and each frame may be divided into two or more compartments, each to contain a picture. On each side of the framc knobs or screws are provided, acting as horizontal axles, on which the frames hang and turn. What I claim is—

1st. The arrangement of any number of frames counected to one stand for the purpose of carrying photographs and such like articles as above described.

2nd. The frames placed easelwise ouc over the other, either slantingly or vertically, each revolving separately round a horizontal axle, with pictures on both sides, which can be seen by one or more persons at the same time from different positions.

3rd. The side-bearers are fastened to the foot piecc at the middle, but the other parts, being frec, are springy, or slightly flexible, and hollow cuts, in which the framcs catch, are thereby held iu a vertical position.

Patent Granted in America.

303,857. STELLA A. JACKSON, New York, N.Y. "Plaquc."—Filed April 16, 1884. (No model.)

Claim.—1. The glass plaque A, having the plain transparent spot *a* in the centre, and the frosted surface *c* on one of its facces surrounding the said trauspareut spot, substantially as shown and described.

2. The plaque A, having an aunular frosted or ground space *c*, and central transparent spot *a*, upon which the picture B is mounted, the back of the plaquc being coated with paint or other substance to the edge of the picture, aud coveriug the frosted portiou, substantially as shown and described.

HOW TO PHOTOGRAPH MICROSCOPIC OBJECTS.

BY I. H. JENNINGS.

LESSON III.—ILLUMINATING APPARATUS.

IN this country photo-mierography by daylight is troublesome and unsatisfactory. The suu shines brightly during so few months of the year, and is so fiekle when he makes his appearauce, that the photo-micrographer is compelled to fall back on artificial light to do his work. In many respects sunlight would be preferable, were it only always at the command of the photo-mierographer; it costs nothing, is rapid in its action, is more powerful than auy other light, and exhibits objcets illumined by it as we arc accustomed to sce them. The chief disadvantagc of using the sun as a source of light is, that, owing to the earth's motion, the direction of the light is eontinually altering, uccessitating the use of an expensive reflecting instrument, called a heliostat, to keep the rays constantly in any required direction.

The use of artificial light has been condemned by many. One photo-micrographer even goes so far as to say "artificial light is a delusion;" but on comparing results we shall find that, at least since the advent of rapid dry plates, photo-micrographs have been taken by many workers fully equal to any produced by daylight. In fact, certain photo-micrographers who have most strongly advocated the use of sunlight, have uot produeed work even equal to that which may be done by any manipulator of moderate ability with artificial light after a few months' praetice. Artificial light is mueh more easy to manage than daylight, and does not vary so much in actinic quality; hence exposures are easy to calculate, and the illumination is more completely under control.

The light given by burning magnesium is the richest in aetinic rays. If the stu lent possesses a Solomon's magnesium lamp, he will find no difficulty in working with this light, the only objection to the lamp being that it eonsumes the magnesium rather rapidly, and thus becomes too expensive to be used constantly. It may, however, be used with great advantage when photographing very minute objects with high powers. The most economical mode of using magnesium ribbon is to burn it in a holder made of tin or brass tube, the bore being just large enough to admit the easy passage of the ribbon. The tube should be about six inches long, and mounted on a stand similar to that of the bull's-eye eondenser, with joints to admit of proper adjustment.

NAVICULA LYRA, × 900.
Taken with a Siebert's $\frac{1}{12}$ immersion. Exposure about fifteen seconds to magnesium ribbon in a holder.

When using the holder, a spirit lamp should be placed opposite the aehromatie or other condenser, and the magnesium holder placed in sueh a position that when the ribbon is thrust through the tube, it may enter the flame of the spirit lamp. Some difficulty may be experieneed in getting the ribbon to properly illuminate the screen, but a few experiments will render the matter easy. The writer has made considerable use of the above simple apparatus, and very satisfactorily; but as it necessitates two manipulators—one to attend to the light while focussing and arranging the correct position of the light, and another to superintend the screen and focus—he much prefers, for all purposes, a good paraffin lamp.

A well-made lamp is necessary, but good paraffin still more so. Avoid all low-priced, strong-smelling oils. Paraffin sold at 8d. per gallon is not only unfit for photo-micrography, but absolutely dangerous. When burnt in any lamp with a large wick, it begins to evaporate rapidly as the lamp gets warm, and after a while the flame will rush up the chimney, blackening it, perhaps cracking it, and frightening the operator, if doing nothing worse. Reliable paraffin may be had at 1s. 6d. per gallon, and this will give more satisfaction in every way. Duplex lamps may be used, but they present no advantages for photo-micrography. They give out much heat, consume a large quantity of oil, and the double wick is troublesome when using high powers. A single wick is far preferable, but it should be the broadest possible to obtain.

The lamp devised by Mr. Dallinger specially for working with high powers, is, perhaps, the very best yet made; but photographs can be taken with any paraffin lamp; For some time the writer used a tiny microscope lamp, and took some very successful photographs with lenses varying from 2 inches to $\frac{1}{8}$th inch, but the exposure was necessarily long with all of them. The object of the photo-micrographer should be to make his exposures as short as possible, and this can only be done by using a powerful lamp and a vigorous developer.

The light from a broad-wick paraffin lamp will be found sufficient for even high powers, but the brilliancy of the light may be much increased by putting a lump of camphor in the bowl of the lamp. Gaslight and candle-light are far too unsteady to be used for photo-micrography.

WIND.

BY H. P. ROBINSON.

THE photographer, almost as much as the sailor, is at the mercy of the winds. Nobody knows how the wind blows till he becomes a landscape photographer. Everybody knows how the east wind searches, pierces, and cuts the body, but it takes a portrait photographer to perfectly appreciate the wreck it makes of the appearance of poor humanity, and a landscape photographer to discover the irritating qualities of a gentle breeze. Yet, on the other hand, how long has the unfortunate marine photographer sometimes to whistle for a wind before he can get those magnificent storm effects he so much desires, and to which he has devoted his holiday!

The effect of the east wind on the sitter is so destructive to good looks that none but the most case-hardened to biting cold should face the camera in a March east wind. It is not the intensity of the cold that does it, but the horrible blighting bitterness of the wind that causes the mischief, that turns the nose blue, shrivels up the face, and sets the teeth chattering. The pleasant author of "Tiny Travels" has a great abhorrence of the east wind. He says:—"It is totally different to other breezes; it has not a blustering honesty about it. It is a nasty, sneaking, insidious, underhand, unprincipled kind of a wind. It appears to open the pores of your skin till it is like a colander; it riddles your bones with fine pinholes, and then blows through them till you seem to have neuralgia all over your body. It penetrates the thickest of cloths, and the most formidable of friezes. You may fortify yourself with flannel waistcoats, you may don double-breasted sealskin waistcoats, you may wear three or four pairs of trousers, but the east wind will penetrate everything, and make you as miserable, as hoplessly wretched, as man can possibly be." And when a man looks hopelessly wretched it is not fair to take a photographic advantage of him and perpetuate his miseries. An ancient distich used to run something like this:—

> "When the wind is in the north,
> Take not the wretched sitter forth."

That was in the pre-studio days, when portraits were taken in the open air; but it is impossible to keep the east wind out of even the most comfortable studio; no amount of hot-water pipes and firing will do it; and there are some people so sensitive to the "ill wind" that they easily feel it in bed, and it would almost search them out in a Turkish bath.

The printer also has his complaint against the wind when in this obnoxious quarter, as it is said to crack the surface of albumenized paper; but it has not such an injurious effect on our negative process as it once had.

It was a well-known fact in the collodion days that cold retarded the exposure, but I have not noticed that it has that effect on gelatine plates. Indeed, some of my best sea pictures have been taken in intensely cold weather. I shall never forget being frozen nearly stiff in a North East gale at Deal, although it was the end of March and the sun was shining brightly. When I had exposed my last plate—I had waited a long time to press the button of the drop-shutter—I found myself so frozen that I could not return the slide of the shutter, and had to be gradually thawed.

The wind that gives the landscape photographer most trouble is not, at a first glance, an unmerciful one. It is the moderate, constant breeze that almost laughs the landscapist out of his life. The photographer knows what to do with a gale, or even a moderately high wind; he can postpone his excursion until another day. It is always satisfactory when the weather decides for you authoritatively. When the wind blows until it "cracks its cheeks," or the rain descends in water-spouts, the photographer can, with a good conscience, put away his traps and wait for better times; but it is the day that is *almost* good enough that tempts the photographer forth—to do bad work.

Given a day suitable for the work intended to be done in every respect except wind, it becomes a question whether the photographer should take his chance and run the risk of getting his exposures between the gusts. There are cases when necessity, the mother of invention, becomes the parent of expedition; and the operator, having only a single opportunity, is compelled to do the best he can to secure a view, if not under the best conditions, then as good as he can get them. It is my experience that in these cases fortune often favours the brave, and the view comes off. I am always inclined to "take the chance" if there is one, but if, after waiting for some time, there is obviously no likelihood of getting good light or reasonable freedom from motion, I give it up, and do not allow myself to waste a plate.

These are occasions when it is well not to be too critical. It sometimes happens that a photographer has gone a long distance to secure some pictures, and has a limited time to do them in; he must then be satisfied to get the best the weather will allow. It is possible, however, to dodge even the wind.

In a photographic fortnight which I enjoyed this summer, I was very much bothered by wind. It blew with a moderate to full strength all the time, but did not prevent me exposing my usual number of plates, although it gave me a great deal of trouble and waiting to do so, and perhaps deprived me altogether of one or two subjects—the best, of course, as usual—but they are possibly not lost, only saved for a future time. There are some districts in which the wind never ceases to trouble, and the leaves are never at rest. Tunbridge Wells is one of these restless places. It stands high above the sea-level, and appears to have never less than a continuous gentle breeze playing over it. Yet, such is the perversity of the wind that, now I have written it is never still here, I look up from my writing, and notice that there is not a leaf moving! This is a very rare occurrence. In other parts of the kingdom I never fail to notice that even on windy days there are occasional intervals of perfect peace; that when the wind is troublesome in the valley, it is quiet on the hills; when it is blowing on one side of a wood, there is a lull on the opposite side.

When there is no life in the subject, it is possible, in nearly all cases, by waiting patiently, to secure an exposure without the disfigurement caused by moving foliage. An exposure may be got piecemeal, so to say. When the branch of a tree is blown about ever so violently, it nearly always returns to its place, thus enabling the photographer to snatch his exposure a bit at a time. I have known an hour expended in getting an exposure of twenty seconds, a few seconds at a time as the wind would permit. But it is when you have figures in your view that wind torture comes in. The best models tire in time: I never knew one that could stand for ten minutes or a quarter of an hour without becoming limp and exhausted, necessitating a rest or a refreshing run. Now it is during this rest, however short, that the wind finds its opportunity to torment you, and dies away when you are unprepared. At other times it will leave everything at rest except some small but very conspicuous branch. You persuade yourself that a trifle like this will have no material effect on the picture, and you uncap your lens, but this moving branch annoys you for ever afterwards; it is the first thing you see in the picture, although it may not be seriously visible to anybody else.

One of the worst forms of wind torture occurs when the gentle breezes seem to take a fiendish delight in humbugging you. You come to a beautiful view, with a good deal of foliage, and when you first see it it is perfectly still, and looks photographically lovely. You unpack quickly, and are soon ready to make an exposure. As you put your hand on the cap of the lens, and, thinking to yourself "I have got it this time, anyhow," gleefully counting your chicken before it is hatched, a gust of wind comes and upsets all your calculations. You call to your models to take a rest, and let the wind blow itself out. In a few minutes it again tempts you to get ready. It very nearly dies away, but not quite, and you determine you will not miss perfection for want of a little patience, and decline the invitation. Then the breeze increases and continues, and you sit down to wait, but soon find that the sun is moving on, and your light and shade is not so good as it was, and you get fidgety about your models, and fear you are tiring them. Then you begin to feel sorry you did not take that almost good chance that occurred twenty minutes ago. Then you determine to snatch the next opportunity that has any promise in it, and get ready. The breeze is dying, with occasional short puffs; there is only a slight, general movement, with here and there a wagging branch. You shout to your models to get ready; then the breeze slightly increases, and you, fearing the wind is about to come on in full force, uncap your lens—the picture is done, for better or worse. You unship your camera, and then take another look at the view. What a change! That puff of wind during which you exposed your plate was the last flicker for a time, and all is peace—not a leaf stirring, not a ripple on the placid water. But you have exposed your last plate, and the serene calm is but a mockery!

When the wind is welcome to the photographer is when he wants to get some of the grand effects that are presented by the sea lashed into fury by the storm. It may be true of photographing the sea that "Peace hath her victories no less renowned than war," but to me the sea when calm has few attractions. There is nothing to me more enjoyable and exhilarating than having a fight with such a refractory sitter as a storm-driven wave. The difficulties which ought to drive you to despair only add to the enjoyment. If the wind is inshore and blows anything like a gale, your lens is fogged with spray as soon as it is uncapped; you have therefore to have an elaborate cleaning up after every time you endeavour to get focus or to see how the subject looks on the ground glass; you have to take careful precautions not only that your camera is steady during exposure, but that it "stays put," as the Americans say, and does not fly away. Nothing is better for ensuring stability than bags of stones suspended from the top of the tripod. A focussing cloth is quite unmanageable on these occasions, and must be done without as much as possible. The elaborate wrapping up of the camera, so much affected by some photographers, is a great tempting of the wind, and is not necessary if the camera is properly made. What can be more exciting than, with finger on trigger, watching wave after wave as it thunders on the shore, trying to determine on the instant if the arrangement is picturesque or otherwise? Truly the successful photographer, in this kind of work especially, is like the most successful general, the one who makes the least mistakes.

A PHOTOGRAPHER'S METHOD OF MAKING HIS OWN EMULSION PLATES.

BY RANALD DOUGLASS.*

BELOW is given a good way for making one's own plates, which, if carefully and exactly followed, will give absolutely reliable results. Extreme care and cleanliness are necessary at all stages of the process.

In the first place, select the glass—use the flattest lights for larger plates, and cut down the curved or irregular one to be used for smaller plates. The edges are to be roughened as usual. The plates are then laid, one by one, in a porcelain or stoneware dish, which holds the acid—1 part acid to 5 to 10 parts water. Pure acid allows more water to be used than does the common article. I use a mixture of nitric and sulphuric acids. After several hours' soaking take them out, and wash and albumenize as for wet.

Below is an excellent formula, I believe Brooks's:—

Albumen of one egg	
Water	20 ounces

Shake or beat to a froth, then add 20 drops of carbolic acid in 1 ounce of alcohol; add this mixture to the albumen, and filter through cotton or paper. In coating with albumen, let the first application run off into the sink, then give the glass a second coat, and rack up to dry.

No. 1. Weigh out 200 grains of Simeon's Swiss gelatine, put it in a pitcher or any convenient vessel, and cover it with cold water—tap-water is good—and allow the gelatine to soak till swollen, which takes fifteen minutes or so; pour off the water and drain, then add to it the following: 360 grains of bromide of potassium dissolved in 4 ounces of pure water, to which is added enough dilute hydrobromic acid to turn blue litmus paper fairly red—not too red. The hydrobromic acid is diluted 1 to 5. Now dissolve in a water-bath the gelatine and the bromide, and pour it into a bean pot, which can be found in any grocery or cookery shop; it has a loosely-fitting lid.

No. 2. Dissolve 450 grains of nitrate of silver in 7 ounces of warm water, which should be pure; tap-water is good.

No. 3. 25 grains of iodide of potassium dissolved in a drachm of water. Now carry Nos. 1, 2, and 3 into your dark-room and close the door; allow orange-red or ruby light in it. Add No. 2 slowly and a little by little into No. 1, which is dissolved in the bean pot. Now, with a strip of glass, keep stirring briskly while the silver is being added. This prevents coarse particles from being formed. After all the silver is added, add lastly No. 3; stir for a little while longer, then put on the cover of the bean pot, tie over the top several thicknesses of orange or red cloth or paper, which will allow steam to escape, and at the same time keep out the light. By this time I suppose your water-bath is boiling. Put in your bean pot, but not to quite touch the bottom of the water-bath; something must be arranged to hold it an inch or so above the bottom. If you want ordinary rapid plates, say as rapid as those marked six times as rapid as wet (if you are a novice in plate-making, you should begin with this grade), let it boil for half an hour, taking the bean pot out once in a while and shake it and replace. One hour's boiling will give as rapid plates as the best commercial plates—at least, it has been my experience.

Suppose the time of boiling is now up, take the bean pot out and set it where it can cool down gradually. In the meanwhile, soak 400 grains of Swiss gelatine in enough water to cover it, and when it is swollen, drain, and dissolve carefully and gently in six ounces of water. The heat must be just enough to slowly dissolve it with stirring at, say, 110° F. to 120° F. Too much

* Communicated to the *Philadelphia Photographer*.

heat will spoil it, and your plates will frill. Here use the greatest of caution. When it is dissolved, in the dark-room, add it gradually, with constant stirring, to the contents of the bean pot, which latter should first be cooled down to 90°, or lower. Stir a while longer; then put on cover, place the bean pot in cold water (in summer, ice is necessary); in two hours the gelatine will be set firm. It should be firm. If it is not, add more ice to the water by which the bean pot is surrounded. Now cut up the solid jelly with a strip of glass, take some of it and put it on some open-meshed cloth. I use linen having meshes of about one-sixteenth of an inch. Strain the jelly through the cloth into a one-gallon stone jar half filled with cold water; do so till all your emulsion, has been strained through the cloth. In straining the emulsion your hands must be clean and kept cold. If they are dirty, your plates will be dirty also; if they are warm, part of your emulsion will re-dissolve and be lost. When all your emulsion has passed through the cloth into the one-gallon jar, tie the cloth over the mouth of another jar, which should be two gallons capacity or more, stir the contents of jar No. 1, and pour it on the cloth; put a gallon of water into the jar, and pour it on the cloth again. The water will run through the cloth and leave the emulsion in the form of a cluster or bunch of strings behind. If any passes through it can be caught in the second jar.

If you have any reason to suppose light has got in your emulsion in any part of the process since you mixed it with the silver, you can put two or three ounces of saturated solution of bichromate of potassium in the first jar, fill it three-fourths with water, and return you emulsion to it, and stir and leave it there half-an-hour, then wash it. Fog will be removed, but the sensitiveness will be considerably reduced.

Return your emulsion to jar No. 1, fill it two-thirds with water, stir it, cover it, and leave it ten minutes; then pour it back on the cloth over jar No. 2, which, of course, is first emptied of slops. Repeat this operation six times or so, and your emulsion is well washed. Now allow your emulsion to drain over the cloth till it is free from sloppiness, when it can be now re-melted in the bean pot, which has been well washed in warm water to free it from scraps of old emulsion. Again, here, great caution is necessary with the heat. Use no more than will slowly dissolve it, or it will make your plates frill—110° to 120° F. is about right with stirring. Add to it 1 ounce of alcohol to which have been added 25 drops of carbolic acid. You can now coat a few trial plates, but I would advise to reset the emulsion and let it stand in a cool place, not less than three days, by which means it becomes ripe and more rapid for being kept. The carbolic acid makes it keep well for months; alcohol facilitates ripening and flowing. When wanted for use, take out of the jelly, with a strip of glass, as much as you want, and re-melt at a gentle heat; filter through cauton flannel into any convenient vessel, the bottom of which must come very near to the nozzle of the funnel to avoid air-bubbles. I coat with an ordinary Anthony's 8-ounce bottle. Pour, to avoid air-bubbles, a little on one corner of the plate, which must be slightly warm, or the gelatine will chill on it and produce markings of uneven coating. Spread it with a glass rod, or, better, with your little finger, then rock it to equalise the coating, slip cautiously on a slab of glass or stone previously levelled, wash your finger, and proceed till your slab is full. Take up your plates and put them in a rack as soon as they are set. If the coating-room is too hot, plates will not set; the room should be kept below 90°, or, better, below 80° F.

In summer, you should coat early in the morning, at or before sunrise. Your plates should be set inside of five minutes, or they are prepared wrong, or too much heat has been used somewhere, supposing your slab is quite cold. In such a case, dissolve a sheet of gelatine in as much water as it will absorb, and add it to the emulsion, and it will correct the emulsion, and make it set better. But if you have followed out the above directions carefully, you will have no trouble anywhere. Leave the plates alone in any well-ventilated dark-room for twenty-four hours. In the absence of such, you can get a light air-tight box, large enough to hold a batch of plates, put in a saucer of chloride of calcium, then your plates, and close down the lid and do not disturb them for two days. The calcium salt absorbs the moisture from the air and becomes wet; the air in its turn takes up the moisture from the plates and they become dry, when they can then be used at once, or packed for future use. The chloride of calcium can be dried over a stove and used over and over. It is, indeed, very convenient and very effectual.

Plates made by the above formula can be developed by any of the published formulæ. I prefer pyro and carbonate of potassium. I have given the way that I do, and I do not see any reason why it cannot be followed by others with equal success.

MAKING ENAMEL PHOTOGRAPHS.

BY T. INGLIS.

A SHEET of any smooth-surfaced glass (plate is best) is cleaned by any of the usual photographic methods; now rub over the plate a solution of alcohol containing about five drops of nitric acid to the ounce; rub over the glass and polish with a dry piece of Canton flannel; finally dust a little soapstone or French chalk from a small muslin-covered box containing the chalk; brush it off lightly with a clean piece of Canton flannel; be careful not to rub hard, as in that case the chalk would deaden the polish of the glass plate. This done, the glass is now coated with plain collodion, five grs. cotton to the ounce of equal parts alcohol and ether. The plate is now allowed to dry, and can be kept in this state any reasonable length of time. When dry lay the plate upon some level place and cover with a solution of plain gelatine about the consistency of cream, at a temperature of 90 or 100 degrees; allow the plate to lie flat until the gelatine sets, which will depend on the temperature of the room.

When dry, stand the plate (or plates) up to dry, and store them away; in this state they will keep indefinitely, and it is well to keep a stock on hand in this condition, as pictures can be mounted in a few moments.

To mount the picture, lay one or more of these plates upon some level place over the sink, so that the water to be used will have free escape to the waste pipe. Cover the plates fully with water, allowing as much to remain upon the surface as possible, lift the pictures from the water they have been washed in, and lay them face down upon the prepared surface of the plate, filling it with as many prints as it will hold, arranging them according to their sizes; pay no attention whatever to the bubbles. Have a piece of thin rubber cloth and a squeegee; lay the rubber cloth over the plates, and with the squeegee press the pictures into contact with the glass, at the same time take out all air-bells by passing it back and forth over the plate. This done, run around the edge of the plate with a knife to take off the gelatine and collodion, ½ inch; this is to allow the paper that is mounted on the back of the picture to adhere to the glass, which will thus bind the whole thing down until liberated by being cut inside of this safety edge, otherwise the pictures would be apt to leave the glass before they are thoroughly dry, and thereby lose the brilliancy they would have if properly dried. After the pictures have got surface dry, give them a coat of thin gelatine, and cover them with a wet sheet of Manilla paper or any common paper same size as the plate; now mount them with cardboard, known as printers' card-board, because it is cheap and answers every purpose; finally cover the whole with an enamel sheet of paper of any tint desired, thus having an enamelled mount, when the picture is finished, as well as an enamelled photograph. After they are thoroughly dry, cut inside the safety edge, when the prints will come off with all the beautiful finish possible. The prints may now be stamped out with a round or square cornered die, or cut with a knife any desired shape; the edges may be bevelled and bronzed with a little gum-arabic and bronze applied with a camel-hair brush.

The whole operation is simple, and not nearly so complicated in its working as it appears from the description of how to do it,

Correspondence.

THE POTASH DEVLLOPER.

SIR,—Like your correspondent Mr. J. H. Jennings, in your issue of the 22nd ult., I desire to avoid the, to me, most unpleasant fumes of ammonia. I likewise have tried the soda developer, but without encouraging success.

I read of the potash developer in your issue of the 1st inst., and actually got the ingredients, but hesitated to make them up, fearing only another disappointment.

Mr. Jennings' letter decided me to try the potash, and with my first attempt, I thought I had "struck ile." The development was beautifully gradual, and, so far as I could judge from most of the usual signs, it was perfect within a

reasonable time, though not within five minutes; but I did not mind that, as I prefer a "slow but sure" development. My delay seemed to arise from the fact that I could not obtain that density of the negative, when viewed by transmitted light, which I have been accustomed to see and depend upon. Moreover, by reflected light, the picture did not darken nearly so much as I have been generally used to see, but, on the other hand, my development was continued so long that the picture was almost as clear on the back as, on the front of the glass; so as all detail seemed to be perfectly out, I decided to wash off, when immediately the plate, like Mr. Jennings', frilled most horribly, though I practically saved it by prompt transference to the alum bath. Here let me say that I have avoided subsequent frilling, to any great extent, by not soaking the plates in water previous to development; while, on the other hand, the non-soaking in water before applying the developer has seemed to give rise to "marbling."

But the point I wish to make is, that when I finally took my negative into daylight and looked through it, I found it weak, although beautifully clear and soft. In every subsequent plate developed with potash my experience has been the same. The negatives have all been weak, although as good as I can hope for in all other respects. Intensification has improved all of them; but then I do not care to have to always intensify. I may say that in my efforts to get density I have used twice and thrice the quantity of the pyro that would usually suffice.

I should be extremely glad to know how Mr. Jennings manages to make this potash developer (as he says) far more powerful than the ordinary pyro and ammonia.

As I am unaccustomed to write to the fourth estate, perhaps I had better put my enquiries more definitely for brevity in reply.

1. How to obtain sufficient density by potash developer?

2. How to know when sufficient density is obtained, inasmuch as the usual signs (all save the image seen through the back of the plate) seem to fail with the potash?

3. As a matter of fact, does the potash developer require twice to four times the amount of pyro which would suffice if working with ammonia, and for normal development?

4. Has the ordinary alum bath any reducing effect on a negative developed by the potash formula, and put in said bath after fixing, having been in a chrome alum bath before fixing?

Since writing the foregoing I have again tried the potash developer on two negatives, one with one-third longer exposure than the other. I took the longer first, and it came up and developed as well as I could wish, finally giving evidence of density by both transmitted and reflected light, as well as by showing the image very plainly on the back. I then developed the shorter exposure, giving a little added strength to the developer. It also came up, and developed as well as one could wish. To all appearance, both were a little inclined to frill; so, after a very gentle wash, they went successively into the chrome bath, thence into the fixing bath, and thence—the first developed negative—into the plain alum bath, as in usual practice. By the time the second negative was fixed, the first had been in the plain alum bath between five and ten minutes. Looking at both by daylight, I was surprised to find the first negative markedly the weaker, while the second is decidedly the strongest I have yet had with the potash. It was only in and out again of the plain alum. Query: Did the alum reduce?

J. G. R.

DEAR SIR,—In your number for the 22nd inst., a letter from Mr. J. H. Jennings commences:—"Having lately been compelled to abandon the use of pyro and ammonia for considerations of health," &c.

I am a little surprised to hear (and somewhat startled, too) that this most usual method of development can be injurious to the health, and should feel much obliged if you will kindly tell me whether there really is much or any danger; and if so, in what way, and where is the injury likely to arise.

I imagine the fumes of ammonia are what Mr. Jennings alluded to.—I am, obediently yours, SURREY.

FRENCH TRIPLETS AND THE POTASH DEVVELOPER.

DEAR SIR,—Mr. Bottone's assertion that French triplets, costing 9s., are far better for general photo-micrographic work than English lenses costing ten times the price, will not, I think, be endorsed by the experience of the majority of workers, English or foreign. Were this the case, it is strange that Dr. Maddox and Mr. G. E. Davis, in England, Dr. Woodward and Dr. Sternberg, in America, and Dr. Koch, in Germany, should all agree in using for their work the very best lenses that opticians can manufacture. The inimitable photographs taken by Dr. Woodward could not have been produced if he had not had at his command the most perfect apparatus that money could purchase; while Dr. Maddox, who has had more experience in photo-micrography than any other man in this country, has, I know from what he has told me, no very high opinion of cheap French lenses, and has pointed out defects in lenses which my smaller experience had thought nearly perfect for photo-micrography. In this I thought photographers and microscopists were one, viz., that the best lenses were necessary for the best work. I think this is the general opinion. My own experience of microscopic work extends over twenty years, and although at first I was satisfied with the cheaper lenses, my advice now to all purchasing apparatus is, *have none but the very best English work, if it can be afforded.*

I write only for beginners, and I know the annoyance of being hampered with apparatus which more mature experience finds out to be unsatisfactory. Mr. Bottone has, no doubt, enough knowledge of landscape photography to know the difference between a photograph taken with a cheap French doublet, and one taken with such a lens as a Ross' symmetrical. For the beginner, the former may answer well, but the expert will only be satisfied with the latter; yet even the beginner had better use the Ross' lens in preference.

A $\frac{1}{4}$-inch is certainly rather a high power to use on such a large object as a fly's tongue. A good English $\frac{1}{10}$-inch, $\frac{1}{2}$-inch, or even a wide-angle $\frac{3}{4}$-inch, will give far better definition than the French $\frac{1}{4}$-inch triplet, and all the necessary penetration, besides giving more light, and allow of great amplification, without spoiling the definition.

I do not quite understand about Mr. Bottone's French $\frac{1}{4}$-inch triplet, which has a working distance of a quarter of an inch. I suppose a microscopic $\frac{1}{4}$-inch objective is so called because it has a magnifying power equal to that of a single lens of $\frac{1}{4}$-inch focal length; thus I cannot see how a compound lens like a triplet, in conjunction with the eye-piece, can have a working distance equal to that of a single lens of the same magnifying power. I have handled at different times nearly all the lenses of our English makers, besides many French and German lenses, and all had a working distance considerably shorter than their nominal focal length.

As to "penetration," Mr. Bottone must know that this is not a quality peculiar to any particular lens, but dependent, like "depth of focus" in a photographic lens, entirely on the diaphragm used. If penetration be chiefly desired, then the cheap low-angle lenses now supplied by all our best makers will fully answer all requirements, and, at the same time, define better than any cheap French lenses. I have a $\frac{1}{2}$-inch of 60°, by Swift, with which I have often exhibited opaque objects at a *conversazione*, which will yet easily resolve *P. angulatum*. This test, when dry, I consider a very easy one. I once had a $\frac{1}{10}$-inch by the same maker, which also resolved this test well. Both are cheap lenses.

Short working-distance I do not consider a defect.

Sixteenths and twenty-fifths come rather close to the glass: but even when working with the former power at a distance of 5 feet from the focussing-screen, I never found this any disadvantage.

If more penetration be desired from good lenses of wide or even moderate angle, it can easily be gained by using the Davis "aperture shutter." This point is, I think, conclusively settled by a series of experiments made by Mr. G. E. Davis, the results of which were published in the September number of the *Northern Microscopist* for 1882, to which I would refer Mr. Bottone. If he does not see this magazine, I shall be happy to lend him my copy.

As to the relative value of different developers, no fixed rule can be laid down. That some people *do* find the pyrogallic developer beyond control, I know well, but *why* I can't say. For my own part, I find ferrous oxalate too mechanical and "inelastic." Pyro can be easily modified to suit the varying requirements of subject and exposure. In photo-micrography, in particular, some subjects with high powers require the minimum exposure, and here I have found ferrous oxalate fail. I have, perhaps, worked more with a 1-16th inch than with any other power, and for such work I found I could never get a sufficiently vigorous image with this developer.

Regarding the ill-effects of pyro and ammonia, I need only quote Mr. V. Elsden in the YEAR-BOOK for 1881:—"Vapour of ammonia may produce inflammation of the lungs." Dr. Geo. Herschell has also warned photographers against the use of ammonia. All persons, therefore, who may have delicate chests, should avoid the use of a developer containing ammonia.

If Mr. Bottone will write to me privately, I shall be most happy to answer this or any other question more fully.—I am, sir, yours faithfully, J. H. JENNINGS.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 28th ult., Mr. W. M. ASHMAN in the chair.

Mr. J. J. BRIGINSHAW (Hon. Sec.) passed round an application form for the "Exhibition of Recent Inventions," 1885, and said the authorities had extended the time for filling them up by two weeks; he hoped their Society would be well represented. He further said that besides the transparencies already promised at a former meeting for comparison by different processes, the Taupenot process would be illustrated, and Messrs. C. and F. Darker had promised to furnish a suitable lantern for the occasion.

Mr. A. HADDON (Curator) suggested that this display of transparencies should take place shortly, to enable members to select the most suitable process for their own use before the season advanced; and he hoped that each contributor would give a concise resumé of the method adopted.

The subject of density becoming greater by keeping negatives was next discussed, and a Member passed round some very fine gelatine negatives which were rather dense. These had been developed with Newton's soda developer more than a year ago, and the exhibitor was certain the density had increased since then. The temperature was above 90° F. when they were developed, and there was no frilling, chrome alum not being used in preparing the plates.

Mr. W. E. DEBENHAM was quite certain that some wet collodion negatives increased in density by keeping; although formerly he very slightly intensified all his wet plates, he never made them approach chalkiness, yet they appeared to do so now.

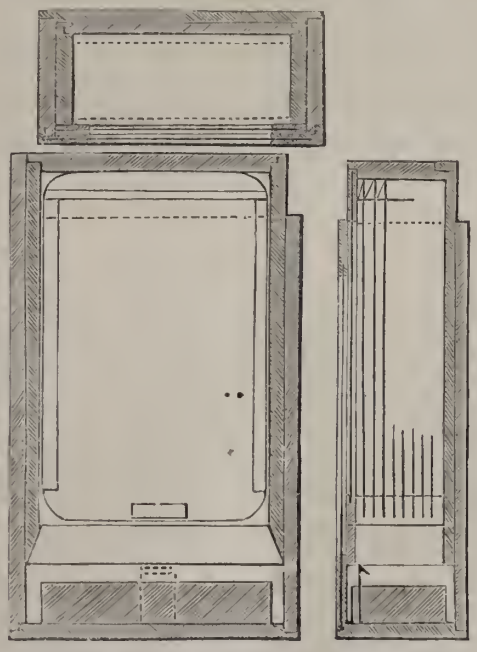
The CHAIRMAN had not discovered any change in his collodion negatives, very few of which had been intensified, and considered the slight intensification resorted to by Mr. Debenham to have set up the action. He thought the change spoken of in the gelatine plates shown was more apparent than real, and elicited the reply that fumed paper was employed when the negatives were first printed from, but not in the case of those prints made recently.

A Member said that some years ago Blanquart Evrard described a means of obtaining results of a more artistic character by exposing wet plate negatives to daylight after developing and washing, but before fixing; portions could be so lighted if suitable masks were laid over the negative, an exposure ranging from five to ten minutes being usually sufficient for the purpose. The negative was kept wet, and fixed and washed afterwards. The artistic effect being often unmistakably improved, it would be interesting to know what change is brought about—whether it is a change in the colour of the silver atoms, or an agglomeration of them might with advantage be studied under the microscope.

Mr. W. COBB recollected Mr. Valentine Blanchard recommending a similar proceeding in the case of under-exposed negatives.

The CHAIRMAN observed that when negatives were much under-exposed, the darkening action was not sufficient to gain much in printing quality; if the plates were flooded with dilute solution of bichloride of mercury, and after exposure to light were dried and printed without fixing, better results would be obtained.

Mr. J. B. B. WELLINGTON exhibited a new changing-box and dark slide combined. It was composed of two rectangular boxes, the inner one containing ten plates fitted in metallic frames, being arranged to slide within the outer case, which was fitted with an automatic metal catch arm to fall into a socket in the frames, thus securing the front plate during exposure, and releasing it upon changing the position of the box. It was necessary to withdraw the inner case upon each exposure,



as will be gathered from the sketch, wherein the outer case is shown partially drawn up.

Mr. F. W. HART exhibited a flap shutter capable of working in either direction at any desired speed, and arranged to act as a sky-shade adjustable in proportion to the requirements of the picture. After a very rapid exposure the shutter required re-setting before exposing again, but not so when the action was slow.

Mr. COBB said its special value was in being able to give a prolonged exposure when required.

Mr. HADDON passed round a frame on which he had woven copper gauze with a mesh $\frac{1}{6}$ of an inch; this was merely to show the ease by which it could be done. He had seen some paper baskets made of wire, which might answer the purpose. Other articles were also mentioned which were considered suitable.

In reply to a question from Mr. Debenham, concerning the effect metallic portions of apparatus may cause on an emulsion,

Mr. COWAN said that heads of screws in wooden vessels had no effect, so far as he could find, in any of his emulsions.

Talk in the Studio.

THE MANUFACTURE OF OXYGEN ON A LARGE SCALE.—The method of Boussingault, in which caustic baryta is heated so that it absorbs oxygen from the air, and is then made to give up the absorbed oxygen by the application of increased heat, with or without the use of steam, has long been regarded as impracticable; but the recent experiments made by the brothers Brim at Passy seem to prove that such a process can be carried on profitably as a means of obtaining oxygen for industrial purposes. Two sets of iron retorts, like those used for the manufacture of coal gas, are mounted horizontally in furnaces, charged with sufficient baryta to about half fill them, and heated to between 500 and 600 degrees Centigrade. Air is now pumped into one set of retorts, when it is found that each kilogramme of baryta absorbs from twenty-five to sixty-eight litres of oxygen. The baryta being now saturated with oxygen, the retorts are exhausted, and the temperature is raised to 800° Centigrade, when the oxygen is evolved and pumped out. By having two sets of retorts the operation is rendered continuous, as, while the baryta in one set is absorbing oxygen, the baryta in the other is evolving that which it previously absorbed. The brothers Brim propose to aërate water with oxygen and sell it as a drink; but it seems that this proposal was made some years ago by M. Maumené, who also suggested the use of nitrous oxide in the same way. Water saturated with nitrous oxide (laughing gas) is said to possess the power of producing the same kind of hilarity which results from inhaling the gas.

BALLOON SOCIETY.—The Centenary of the first aërial voyage in England will be celebrated on September 13th, in the Honourable Artillery Company's grounds, Finsbury. Photographers (members of the Balloon Society) can obtain tickets from the Society.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, September 10th, will be "On the Effect of Different Alkalies in the Development of Gelatine Plates." Saturday outing at Hale End. Train leaves Liverpool Street at 2.2 p.m.

To Correspondents.

*** We cannot undertake to return rejected communications.

A. B.—1. Soak the emulsion, previously broken up in small pieces, in some old fixing solution; next filter, and add a solution of sulphide of potassium until no more precipitate is thrown down. Collect this precipitate, and reduce it by fusion with about twice its weight of sodium carbonate. 2. Probably fifteen or twenty pounds.

E. J. LOVEJOY.—Next week.

J. AND A. G. H.—Thank you, but we shall not require the model again, having made note of all the points of importance.

T. STEVENSON.—Very good indeed; is quite suitable for the kind of work you refer to.

T. W. O.—No. 5 will be most suitable if you only take one lens, but it would be desirsble for you also to have one of shorter focus.

AMICUS.—We do not know the address, but believe that the person referred to is still alive.

A. G.—1. You are quite right as to the necessity of a longer exposure. 2. It may be a useful medicine, and yet injurious to a healthy person. 3. A bag made of two thicknesses of black cloth, and provided with short sleeves and elastic bands for the wrists, will answer very well.

E. Y. E. N.—It would probably liberate sulphur, and might cause rapid fading to set in. There is less objection to the use of alum, the following being the usual way:—Soak the partially-washed prints in a mixture of four ounces of a saturated solution of alum and a gallon of water. Several rinsings are required to remove the alum (see page 283 of our volume for 1883). 2. It will not do, as the contractile quality of gelatine will cause it to scale. 3. The ordinary process on albumenized paper; but you will find some useful remarks on page 429 of the present volume. 4. No book now in print gives working details; your only way will be to obtain an old edition of some handbook, such as "Hunt," or "Hardwich," at a second-hand book shop. 5. We do not quite understand the question in the way you put it, but imagine that the above answers also give you the information you require under this head.

ARTHUR T. D. BERRINGTON.—Gum a strip of paper about three-sixteenths of an inch wide on the edge, so that it makes a kind of dish, of which the film forms the bottom. Of course, in working, this "dish" is held upside down.

CAMBRIAN.—Although the word "gramme" is, we believe, spelled without the final "me" in the Act of Parliament legalizing it as a standard in this country, the longer form is more usual. A gramme is equal to nearly 15 ½ grains, and a cubic centimetre is the volume occupied by a gramme of water at 4 deg. Centigrade. You may take it that a cubic centimetre is 1-28th of an ounce. 2. Moisten the tip of the finger with a trace of turpentine, and rub gently over the surface of the varnish until dry. 3. Glass.

J. B. A.—No. 2 is insufficiently fixed, and the spots on No. 1 appear to arise from original defects of the plate. On No. 3 we can see no stains; but there was some dirt on the reverse side of the plate. The slight tint all over the plate may perhaps arise from over-exposure or, from unduly forcing the development.

J. A.—Sandarac 18 parts, mastic 4 parts, ether 200 parts, benzole 80 to 100 parts.

JOHN B—.—1. It is scarcely worth while to take the trouble to make up a solution of potassium iodide and to add to it separately, as the first plate immersed will saturate the bath with iodide of silver. 2. For such purposes you will require to have the bath in very good order, and we are inclined to think it would be better to make up a fresh solution. Of course you will recover the silver from the old bath.

LUX.—1. Pulp made from wood is largely used by paper makers at the present time, and unless the wood fibre is very carefully freed from all traces of the incrusting matter which naturally covers the fibres, the paper is subject to become yellow on exposure to light.

COMMON SENSE.—We have obtained good results with a solution containing 40 grains of the former and 2 of the latter to an ounce of water; but certainly it would be unreasonable to conclude that the usual practice of making up the solution by weight and measure is bad, because the strength may be varied within wide limits without much vitiating the result. 2. Obtain as perfect transparency as possible before treating the negative as you propose.

ARTIZAN.—1. Doubtless from the use of dirty glasses. 2. Over-exposure is probably the cause—try about one-fourth. 3. It consists of gold in a fine state of division.

B. T. OSMOND.—You have evidently had no practical experience in lens grinding, or you would not ask such a question, so you had better send the instrument to the maker. It is, however, doubtfull whether the spare thickness will be sufficient.

SIGMA.—The so-called magic photographs are made by soaking fixed but untoned silver prints in a saturated solution of mercuric chloride until the image disappears, and then drying the whitened prints. A solution of sodium hyposulphite revives the latent image; but the usual way of applying it is to lay a piece of blotting-paper, which has been moistened with a saturated solution of "hypo." and dried, on the bleached print, and to damp the blotting paper.

CHARLES.—It does not keep well in solution, so you had better dissolve it as required for use.

The Photographic News Registry.

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Printer and Toner.—H. Lane, Margaret-rd., New Barnet, Herts.
Operator and Retoucher, at £3 10s.—X., 43, Pier-st., Ryde, I.W.
Assistant Operator (general).—Chloride, *Photo. News* Office.

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Retoucher, first-class.—F. Guy, 70, Patrick-st., Cork.
Articled Pupil.—Messrs. Downey, Ebury-st.
Retoucher, Colourist, &c.—Mr. Chapman, Clapham Common.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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CONTENTS.

THE POTASH DEVELOPER.

THE worker with gelatino-bromide plates cannot complain of a lack of developers. Pyrogallic acid, ferrous oxalate, ferrous borate, ferrous sulphite, ferrous phosphate, various ferrous tartrates, hydrokinone, sodic hydrosulphite, &c., have all been used by different workers at various times. Only two, however, from this long list have really found favour, and have come into general use. These are pyrogallic acid and ferrous oxalate; but the latter, spite of its many advantages, has not found many advocates in this country, although it is extensively used by our continental brethren. When the atmosphere is clear, and the actinic value of the light can be correctly estimated, there is no doubt that ferrous oxalate is a most valuable developer; but in a climate like ours, where the light is so variable, and where the atmosphere is so frequently obscured by mist, it will hardly give general satisfaction. It gives off no noxious fumes, does not stain the plates nor the fingers, produces bright, sparkling negatives, which print quickly, and have a good "tooth" for the retouching pencil; and, in short, answers well for correctly-exposed and even over-exposed plates; but has the great defect of being inelastic—that is, it cannot be modified sufficiently to meet all the demands of the landscape photographer, who has frequently not only to give his plates the minimum exposure, but to photograph very difficult subjects often indifferently lighted. Here a more vigorous developer is required—one that that can be modified at will to suit plates that have received very varying exposures, and yet give good negatives. Such a developer we have in alkaline pyrogallic. Ferrous oxalate has, and perhaps always will have, its admirers; but the fact that the great bulk of photographers, both amateur and professional, use the pyrogallic developer in some of its many modifications, proves that for general work it is most emphatically *the* developer for gelatino-bromide plates.

Yet pyrogallic acid, as generally used, has some serious disadvantages. Prolonged development stains the negatives a sickly yellow, which injures their printing qualities. It is true, the use of an acid alum bath will generally remove this stain; but this takes time—often a long time in the case of a negative badly stained—and time is precious. Then, if made up in solution, the pyrogallic acid rapidly absorbs oxygen, and becomes useless, so that stock solutions, made up in bulk, convenient as they are, cannot be used. To remedy this defect, citric acid and sodic sulphite dissolved in the pyrogallic solution have been proposed, and they doubtless have great power in preventing its rapid oxidation, and thus keeping the solution clear during development. In fact, by the use of sodic sulphite and citric acid, a solution of pyrogallic acid will keep good for months in a well-stoppered bottle. The use of solutions made up to some definite standard is to be recommended, while the practice of some operators of using the pyrogallic acid dry, and "guessing" at a quantity of two grains or three grains, is to be condemned as both slovenly and inexact. Could grains be weighed by guessing—especially with such a substance as pyrogallic acid—there would be little use for a chemical balance in the photographer's laboratory.

The introduction of sodic sulphite in the pyrogallic developer was a great advance, and did much to oust ferrous oxalate and restore pyrogallic acid its good name, which it had well-nigh lost through its staining qualities. Still, the use of ammonia, necessary to render the pyrogallic alkaline, was objectionable. The fumes of ammonia are most injurious to delicate lungs, and have perhaps, in many cases, done much to induce an attack of pneumonia. Then, strong solutions or prolonged development frequently will fog the plates, and it is always more or less uncertain how much bromide should be used as a restrainer. Too much or too little will equally spoil the plate. Again, some plates will stand almost any amount of ammonia, but when an excess has been used, as in developing a plate that has received an "instantaneous" exposure, the negative is sometimes rendered so thin that no developer will bring it up to printing density. Again, when a solution of ammonia is made up in bulk, it soon loses strength by the evaporation of the volatile alkali, while the use of the dropping tube in the dark-room is decidedly a nuisance.

Solutions of the fixed alkalies, such as potash and soda, are free from these objections; they can be made up in bulk to any standard, and do not deteriorate by keeping. Common washing soda has been advocated by many, and certainly has advantages, not the least being its cheapness, and the fact that it is found in every household; but as it cannot be made up as a very concentrated solution, it is inferior to carbonate of potash, which is far more soluble, and, at the same time, possesses other advantages over carbonate of soda.

In the PHOTOGRAPHIC NEWS for 1883, page 385, we gave Dr. Stolze's formula for a potash developer, which was found in practice to give good results. Since then, on August 1st last, we published a formula as used by Mr. Beach, which, judging from certain experiments, appears to present some advantages over that of Dr. Stolze. We here repeat it for the benefit of those among our readers who may not yet have tried it:—

No. 1.—Pyro Solution.

Warm water	2 ounces
Sulphite of soda (chem. pure) 437 grains to the ounce	2 ,,
When cold, add—	
Sulphurous acid	2 ounces
Pyrogallic acid	½ oz. of 218 grs.

No. 2.—*Potash Solution*

A.—Water...	4 ounces
Chem. pure carb. of potash (437 grs. to oz.)	3 ,,
B.—Water	3 ,,
Chem. pure sulphite of soda (437 grs. to oz.)	2 ,,

Combine A and B in one solution. Both the pyro and potash solutions should be kept in well-stoppered bottles. To develop a whole plate that has had an "instantaneous" exposure, take 3 ounces of water, and add to it ½ ounce of No. 1, and 3 drachms of No. 2. This will usually bring out the image rapidly, and with full density. If necessary, more of No. 2 may be added, 1 drachm at a time, until the image appears. It will be noticed that the percentage of pyro is very large—about 44 grains per ounce—and this proportion may, with most plates, be reduced with advantage, or the negatives will often be too dense for printing. In fact, when using a "10 times" plate for rapid work, we found that half, or even less than half, the pyrogallic acid prescribed above was ample.

To give the developer a fair trial, we exposed a certain number of plates by means of a rapid shutter, and others by the lens cap, on different subjects, and under different conditions of lighting. All the plates used were those marked "5 to 10 times collodion;" none of the more rapid type were tried. On developing the plates exposed instantaneously, in each case the image made its appearance in a few seconds, and with plenty of detail in the shadows. Development was complete in about five minutes; in fact, in the case of the plates exposed in full sunshine, development had to be stopped sooner, to prevent the high-lights becoming hopelessly dense. The negatives were next placed in the hyposulphite without washing; when fixed, they were slightly washed, and examined in a good light. No spots nor stains were visible; each negative was of a clear bluish-black colour, perfectly clear in the deeper shadows, and very vigorous.

For plates which had received exposure by hand, we used the developer as recommended by Mr. Beach:—3 drachms No. 1, and 1 drachm No. 2 in 3 ounces of water. For subjects in strong sunshine, we found this too vigorous unless diluted with twice the volume of water recommended in the formula; otherwise plates that had received an exposure of one second with No. 5 stop of a rectilinear lens appeared somewhat over-exposed. Those that were exposed more rapidly, "cap off and on," gave far more satisfactory negatives, using the same stop; but even in the case of plates exposed on subjects in moderate shade, or on a dull day, all came out more vigorously by using the developer in a more dilute form.

One plate was exposed on a dull, drizzly day—subject, a canal lock; exposure rather less than a second with No. 4 stop. With the ordinary pyro and ammonia developer, this plate would probably have shown some signs of under-exposure; as it was, it developed sharply and well, showing all the detail in the dark shadows of the lock gate.

The last plates, tried with the potash developer, were exposed on a dull but clear day—subjects, pretty "bits" in a rustic village. A single lens was used with $\frac{f}{45}$ stop, and in each case an exposure of less than a second was given, as a high wind was blowing. All, on development, gave fully-exposed negatives.

It would appear from these trials that plates developed with potash require somewhat less exposure than when ammonia is used, which is an advantage in instantaneous photography, and in landscape work generally, where it is often difficult to get satisfactory negatives on a windy day, owing to the movement of the foliage. The entire absence of spots and stains on the negative is a quality that cannot be too highly valued, not only on account of the improved appearance of the negatives, but also because they print so much quicker.

It is possible to develop several negatives in the same solution, but our experiments lead us to think that not more than two can be developed thus; for although the solution does not become turbid, it becomes much less vigorous after being exposed to the air for several minutes. Care should be taken to obtain absolutely pure chemicals, otherwise the developer may not give satisfaction.

Briefly, the results of our experiments would appear to be these:—The potash developer can be prepared in a highly concentrated solution, which only needs dilution with water to various degrees of strength to suit any kind of exposure. It is clean, very vigorous, needs no restrainer, gives no fog, and the colour and printing quality of the negatives developed by it are all that can be desired.

HOW DR. E. ALBERT TREATS HIS NEGATIVES OF PAINTINGS.

IT is generally known that Dr. E. Albert is engaged at Munich in photographing oil paintings by the electric light, isochromatized collodio-bromide plates being used; and the following particulars as to the after-treatment of the negatives will be read with interest.

The negative varnish used consists of:—

White shellac	100 parts
White resin (colophony) ...	70 ,,
Sandarac	80 ,,
Venice turpentine	60 ,,
Alcohol	2,000 ,,

On the back of the plate a matt varnish compounded as follows is used:—

Matt Varnish.

Ether	450 parts
Benzole	250 ,,
Sandarac	50 ,,
Chloroform	50 ,,
White resin (colophony)... ...	5 ,,
Canada balsam	5 ,,

The resinous materials are first dissolved in the ether, and the solution is filtered, after which the benzole and the chloroform are added.

The above is a very excellent receipt for matt varnish—indeed, better than many which we have tried—but it is necessary to use the genuine benzole, not the light petroleum sold under the designation "benzoline."

On the surface given by the matt varnish the necessary work is done by means of the lead pencil and the stump, after which the matt varnish may be removed from those parts where it is not required by scraping, or it may be rendered transparent by being painted over with a solution of shellac in aqueous borax solution (this solution is made by boiling a saturated solution of borax in water, with as much bleached shellac as it will dissolve).

The matt varnish is covered with a protective coating or final varnish made as follows:—

Gutta-percha	15 parts
Purified oil of turpentine ...	300 ,,

This protective varnish does not destroy the effect of the matt coating, whereas most other varnishes would render it transparent and dissolve it.

The above details will not only prove of value to those who may have occasion to work upon negatives of oil paintings, but also to photographers who may find it necessary to do much retouching upon their plates.

MOUNTING AND COLOURING PHOTOGRAPHS IN IMITATION OF OIL PAINTINGS.

THE hundred-and-one methods of endeavouring to obtain artistic results in colouring photographs without the possession of artistic skill seem to depend in the main on similar principles; and putting aside the general fact that a coloured photograph is almost of necessity very im-

perfect, fairly satisfactory results may be obtained by the method termed "canvasine," of which the following description is extracted from a recent number of *Household Words*. The prints should be made from fully-exposed (and not over-dense) negatives, and on thin paper not too highly albumenized. As it appears that the main object of the article, which we quote, is to call attention to secret preparations such as *canvasine solution*, *adhesive medium*, and *canvasine medium*, it may be mentioned that for mounting the paper print, which has been reduced in thickness by glass-paper, a hot ten per cent. solution of gelatine answers admirably, the print being soaked in the gelatine solution. Before proceeding to lay a second sheet of canvas on the face, or to colour, it is necessary to clear away all gelatine from the face of the print by means of a sponge charged with warm water. Ox-gall may be used instead of the preparation termed canvasine medium, and ordinary water colours are suitable.

Anyone familiar with photographic work will diverge somewhat from the subjoined directions, which we, as before stated, quote from *Household Words*:—

"To those who are fond of colouring and painting, and yet how are not gifted with a talent for drawing or designing, or with any large amount of knowledge of the art of producing a pleasing picture, canvasine will be an agreeable amusement. This work does not claim any high place among the pursuits that require a lifetime of labour to bring to perfection; it is simply known as a process whereby an ordinary photograph, taken upon paper, can be coloured and mounted so as to resemble an oil-painting. The way to transform a mere black-and-white design into a coloured picture is very simple, and requires no knowledge of drawing or even of painting; the photograph supplies the outlines, and the impression is not obliterated by the introduction of colour, as paints are so prepared that they amalgamate with the chemicals used in producing the photograph, and sink into, and become incorporated with, the paper. By this arrangement, the shadows, half-tints, and lights of the black-and-white original design are still prominent, and appear like natural shadows in the colouring.

"The system employed in thus painting and allowing the colour to sink into the photograph consists of laying on coats of colour, and wiping them off before more than a tint has become absorbed, the colours being so strong that, if allowed to sink at once into the paper, a crude, hard colouring would be produced. The only art the student has to acquire is the art of patiently laying on successive washes of colour, and wiping them away, until the tint that has sunk in, and been retained by the photograph, is a soft, natural colouring, resembling in its smoothness ivory-painting. In order to transform the photograph into an oil-painting, it is stretched on picture-canvas and rolled with a ruler, so that the coarse thread lines of the canvas show through the photograph in the same way that canvas appears through an oil-painting, and, after the amalgamated tints have been obtained, rough strokes of opaque colour are worked on, and allowed to remain on the surface to imitate the rough lines of oil colouring.

"The manner of painting is as follows:—Choose a clear photograph of one figure only, or of some very distinct group, and match it as to size with the canvas and wooden frame; cut the photograph a little smaller than the wooden frame. Lay the photograph, face downwards, on a drawing-board, and rub it with fine glass-paper, just to take away a little of the thickness, but not so as to remove it unevenly. Drop the photograph into a soup plate, into which pour canvasine solution, so as to cover the picture; let it soak five minutes in the solution, then pour the solution back into the bottle; lay the photograph face downwards on the table, and dab off any of the solution remaining on the surface. Well wet the canvas to be used (which must be larger than the photograph, with a margin of an inch and a-half all round), and stretch it on a drawing-board, holding it down with drawing-pins. Cover the back of the photograph with a good coating of adhesive medium, and lay it on the canvas, so that it is placed in the centre of the latter, and the lines and threads of the canvas run straight with the lines of the photograph. Over the photograph place a piece of spare and dry canvas, arranging its lines in the same direction as those on the wet canvas. Take the roller and firmly roll it backwards and forwards over the canvasses and the picture, until all the creases and air-bubbles on the latter are pressed out; it firmly adheres to the first canvas, and the thread lines are brought out upon it. The spare piece of canvas should be lifted from time to time to see the progress made, and extra pressure applied to any parts of the picture that require it. Extra adhesive can be used, so that the edges of the photograph stick firmly to the canvas. Leave the picture stretched on the board for three hours or more, and until it has perfectly dried; then commence the colouring.

"Before painting, lay over the picture, with a sponge, a little canvasine medium, then put a little of the medium into a tumbler of water, and use that to mix the colours with. Prepare a wash of flesh No. 1, fill a brush with it, and pass it quickly over the complexion, then with a clean sponge wipe the wash off. Some of the colour will have sunk into the photograph, and will look rather spotty; repeat the washes and the wiping them away, until all the greasiness of the surface has been overcome, and a pure colour obtained. Apply flesh No. 2 in the same way to warm the cheeks, and flesh shadows to the sides of the face, putting these over the first washes. Tint round the eyes and nose, the temples, under the chin, and other parts of the face, and when all these places are coloured, amalgamate the whole together with washes of flesh No. 1 laid over the whole complexion. Mark out the features, the lips, the eyes, and eyebrows, with more decided colours, and do not wash these last touches off unless they have been laid on too strongly. The draperies, backgrounds, and other details are all obtained and coloured in the same way—full, clear washes of the desired tint laid on and taken off, and final touches put on with pure colour.

"The picture painted and dry, it requires fixing to the wooden stretcher. Neatly fit it to the frame, and take hold of the margin of clean canvas, and nail this to the back of the frame, so that the canvas is quite stretched out and smooth. When this is accomplished, take the eight small wedges given with each frame, and hammer these firmly into their proper apertures. All canvasine pictures are much improved by being framed in deeply-sunk and wide gold frames, as by the use of these frames the picture does not come close to the surface, and the simulated effect of an oil-painting is much enhanced."

Practical Papers for Beginners.

No. 8.—TAKING A PORTRAIT.

It is easy to see that the number of amateur landscape photographers is very much greater than that of the unprofessional portraitists who work with the camera; but considering that good portraits may be taken without in any way involving an expenditure of much time in arranging backgrounds or screens, it is a little surprising that portraiture is not more generally practised by amateur photographers. We hope, however, that the brief instructions which we shall now give will serve to enable any person who has overcome the essentially technical difficulties incidental to the production of a properly-exposed and developed negative, to make a passable portrait.

Supposing a person to be standing quite in the foreground when a view of a brightly-illuminated landscape is taken, and the face of the person is directed towards the camera, it will generally be found that the result is anything but satisfactory as far as the portrait of the individual is concerned, even although the landscape may be excellently represented in the photograph. One reason of this is, that far more exposure would generally be required to do justice to the face than is necessary for the bright landscape background; and, moreover, the flood of light from the general view quite overpowers that from the figure, and makes it feeble and dark in comparison. Let us suppose now that the camera and the individual remain in the same position, only the flood of light coming from the landscape is cut off by a large screen of a dull neutral tint, placed behind the person, this screen being large enough to shield the lens from all rays coming directly from the landscape behind. An exposure being now made

—but a longer one than before—it will be found that the result is far nearer what one requires in a portrait; the modelling and expression of the face coming out with a perfection hardly to be realized when a landscape forms the background of the picture. Still the portrait will have faults, it being very probable that the top of the head may be so brightly illuminated as to give the appearance of grey hair, and that delicate shading of one side of the face which forms so admirable a feature of the best portraits is likely to be altogether wanting.

The first necessity in portraiture is, then, some kind of a shading surface, or opaque background; and the next is some kind of a shade to go overhead, in order to screen off the more vertical rays; while the fact of a good portrait being occasionally—indeed, very occasionally—taken without these adjuncts does not affect the general statement.

The amateur may use a background made of cloth stretched on a frame, or he can often use with advantage an outside wall, especially if smooth and plastered, or overgrown with a climbing plant. Still we are inclined to recommend that the first attempts at amateur photography should be made in a room, it being possible to very nearly imitate the conditions which obtain in an ordinary photographic studio by carefully arranging matters in an ordinary sitting room having a large window and receiving its light from the north.

The subjoined cut represents one of the studios in which the late M. Adam-Salomon made some of his best pictures, and it will be seen that the principal light enters through

the side window, which is of clear glass, and has a northern aspect, while some illumination is afforded by the half roof of frosted or partially obscured glass. A background of fabric stretched on a wooden frame is behind the sitter, and the wall to right of the camera is not so dark in tint as to prevent the reflection of enough light to ensure full detail in the shaded side of the face.

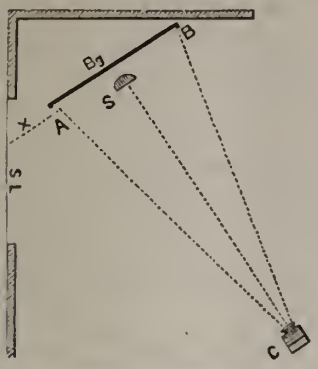
Here, then, we have the most ordinary type of glass house or portrait studio, reduced to its simplest expression, and all the essential conditions can be easily ensured in an ordinary siting room, lighted by a large window; the white ceiling throwing down quite sufficient top light in most cases.

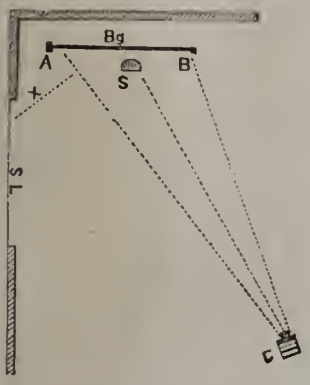
A word as to the background. We may suppose that the beginner in portraiture does not wish to use painted backgrounds, and it may also be supposed that, for the present at least, he will prefer using a plain flat sheet rather than such concave or set backgrounds as are so successfully employed by many of our best photographic portraitists, especially as for the plain background no permanently rigid frame is required. Thick brown paper may be obtained in the roll up to about sixty inches wide, and the material known as Empire cloth, and manufactured by Messrs. Avery, of Great Portland Street, is made up to a width of nearly nine feet. To make a portable background a rectangle of either of these materials may have a stout wooden roller fastened to one edge, and a strip of wood to the opposite edge, so that the whole can be rolled up map fashion, and carried about without inconvenience. Two wooden uprights provided with feet may serve very conveniently for supporting the background by its top lath, and with the exercise of a little ingenuity a very convenient and portable arrangement may be constructed; but it is often possible to extemporize a fairly satisfactory background by tacking a blanket to a large kitchen-horse. Those who prefer to make a background by distempering unbleached calico must mix whiting, water, and size to a convenient consistency, and tint the mixture with some finely-ground pigment, such as burnt sienna; the calico must be stretched on a frame, and not removed until dry. Five feet by seven feet is a convenient size for a background intended for indoor use.

The subjoined diagrams may be given as examples of the way in which the background and camera may be placed in relation to the light, and it may be mentioned that it is by no means essential that the background should be set at right angles to the axis of the camera.

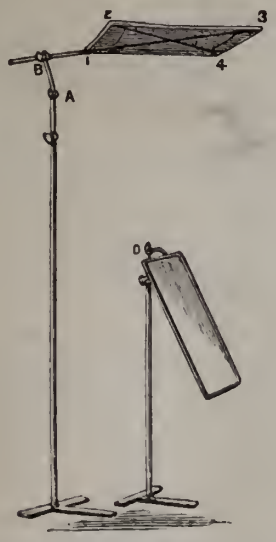
It must not be forgotten that a reflector will often be required to lessen the contrast between the lighted side of the face and the shaded side. This reflector must be so placed on the side opposite the light as to throw just the required illumination on the face of the sitter, and yet must be so arranged as not to show in the picture. A white sheet placed over a kitchen horse often makes the

most convenient reflector, but a large cheval glass on a swing frame is frequently to be preferred. Portable



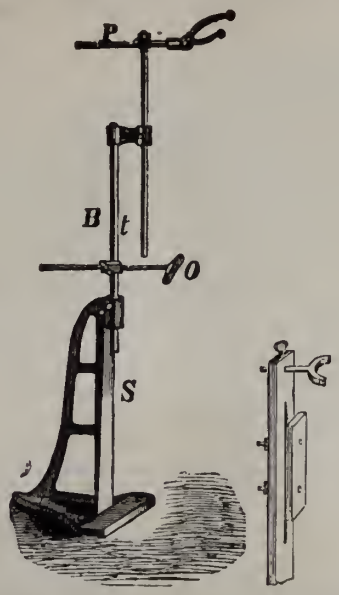


screens or white reflectors, mounted as shown below, are frequently of much value for shading or lighting up any part of the face that may be improved by such treatment.

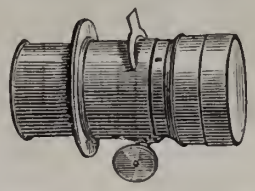


For portraiture, a head-rest is frequently required by the sitter, and he should be told rather to use it as a means of knowing whether he has moved from his position, than as an actual support for the head, and care must be taken so that no portion of the rest or its mounting shows in the picture. Such a head-rest as that shown below—provided also with a support for the hips—is almost an essential to the professional photographer; but the amateur will generally prefer to use a simpler and cheaper arrangement, which can be fastened to the back of a chair.

We have said nothing as to the lens best suited for portraiture. Indeed, we have said but little as to lenses at



all up to the present time. The lens known especially as the portrait combination, or Petzval lens, is familiar, as to the external configuration of the brass work, to almost



everyone. It consists of two lens-combinations, and generally has a working aperture of about $\frac{f}{4}$ when the stops are removed. For a head-and-shoulders portrait taken in a room as now suggested, a stop corresponding to about $\frac{f}{8}$ or $\frac{f}{10}$ is most suitable, as when the fuller aperture is used there is a difficulty in getting the whole of the subject well in focus. The lens used should not have a focus too short (see p. 515) in relation to the size of the portrait taken, it being a good rule to employ an objective having a focal length equal to about double the longest dimension of the portrait; and if this precaution be observed, any photographic lens may be used successfully for portraiture. Still, if a lens having a very small working aperture be used for portraiture in a room as now treated of, the exposure required may be inconveniently long, and for this reason it is desirable to have a special portrait lens.

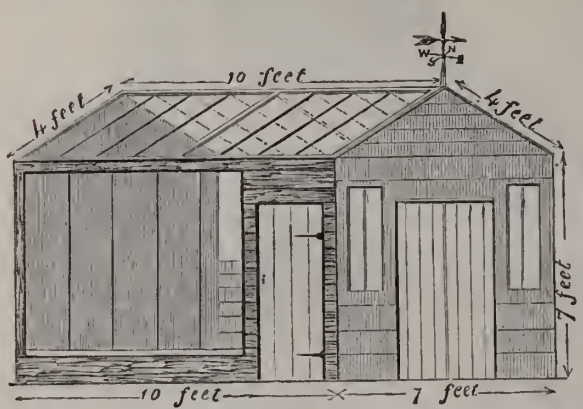
It is not necessary to say more in this place regarding the taking of a portrait, as when the beginner has carried into practice the elementary principles here laid down, he may study with profit the various comprehensive articles on lighting and posing which have appeared from time to time in the Photographic News; but we will merely quote Mr. Bockett's description of his experience in making such a simple glass house or studio as any active and ingenious amateur may easily construct for himself at a small cost.

Mr. Bockett says:—

"Now the chief end in view was to make some erection that could be easily removed, not take up too much space, be watertight, and give a range of, say, twenty feet. The first was obtained by having the place built up of sashes, there being four in the roof (which stands due east and

west); two in the north side, which is close to a low wall, so that none are required below them, and one large sash on the south side; the remainder of the house being composed, for the most part, of feather-edge boarding, the skeleton to which all the foregoing is attached being simple 2×2 inch quartering; the joints are covered with canvas, and painted, which has, hitherto, as to keeping out the wet, answered very well. To enable me to get my range, at the eastern side (in which two small windows are placed), I have two folding doors, simply made of beaded boards nailed to some cross-pieces, which, opening outwards, give me any distance I may require, and effectually protect the sitter, accessories, &c., from the weather. Next to the larger sash before alluded to, and near to the folding doors, is another door, in order that access may be obtained to the interior without disturbing the camera or anything else that may, for the time being, occupy the space between the folding doors.

"Some battens, laid edgewise upon the ground, receive the flooring planks, which would have been all the better if closer together and attached at each end to the bottom frame of the skeleton. The folding doors bolt top and bottom, from the inside, and the side door is locked from without, so that all within is properly secured.



"The shaded part represents wood, mostly feather-edge.

"To equalize the light from the south the whole of the large sash is covered with thin calico blinds, and the same with the roof, except that portion over the head of the sitter, which is covered with paper."

In order to effectually control the light in such a miniature glass house, it would be necessary to provide movable blinds in addition to those referred to by Mr. Bockett; and the beginner must remember that the most complete success in portraiture is only attained by patient study and careful observation.

PHOTO-ASTRONOMY AT THE RIFFEL.

BY C. RAY WOODS.

No. III.

I PROMISED in my last to give readers of the NEWS an account of a photographic excursion here, and hence I am afraid that the title at the head of this article is to some extent a misnomer. Photographic excursions are for me rather rare here, for I am placed in a little difficulty. Successful photographs of the mountains require a clear atmosphere, but on clear days it must be pretty obvious to all that my scientific work requires all my attention. How do I manage? Well—to make a clean breast of it—I take my views, as well as my holiday, on Sunday. Frown not, gentle reader; if you were here, even here in this earthly paradise of English clergymen, you would do the same if you came for work rather than pleasure. Besides, have I not a good precedent in the example set by an English clergyman I met coming from the Gorner Grat one Sunday morning, and who, when I jocosely threatened to tell his parishoners, gravely replied that he had been up to worship?

I think it necessary to vindicate myself thus far; for without some explanation the captious critic might enquire where the corona was, if I told him that one clear fine morning I went to the "Cima di Jazi." I did not take my camera on that occasion, contrary to the advice of a gentleman who said that the panorama was very fine. That was the very reason I did not take the camera, having had no experience in taking panoramas, and being fearful that I might have all my trouble for nothing. What few mountain views I had taken up to that time had turned out unsuccessful, for reasons I shall presently enumerate. Again, negatives forming a panorama must be alike in density; if this is not the case, the results have little artistic value, few plates being complete in themselves, and simply forming part and parcel of the whole. I started out, therefore, in company with Captain Abney's assistant, Mr. Jackson, and a guide, neither Mr. Jackson nor myself taking any apparatus.

Up towards the Gorner Grat, past the Riffelhorn, and along a narrow path three hundred feet above the Gorner Glacier. We had to go carefully at first, for it was three o'clock in the morning, and we had only the stars to light us on our way. Presently, dawn began to break, and revealed the glacier below. Looking behind us we saw the Riffelhorn, and the Matterhorn a little to its left, but away in the background, yet great and majestic as it always looks. Here was the subject of one picture which I hope to take at the first convenient opportunity. Then we soon got down to the glacier, and commenced a walk over the slippery ice till we reached a little halting place sheltered by the Stockhorn, where we stopped for breakfast. Then commenced a long tramp of three hours' duration over the crisp crackling snow. It is a monotonous walk, say most people. We did not find it so. The scene of our daily labour far behind us, we walked briskly on, rejoicing in our day's freedom. Crunch! crunch!—no soft wet snow causing one to sink in at every step; we had started too early for that. Each white particle of snow glistened like a diamond as soon as the sun rose above the great white plain, and in the early morning the mountains looked as they never look when seen from grassy slopes or rocky heights. One has no idea of distance here, and the mountains that towered around us might have seemed close at hand, instead of a mile or two away, had we not known better. To the mountaineer, the trip to the Cima di Jazi is but a mere walk, but this mere walk gives one no bad idea of the grandeur of the Alpine heights. The busy tourist who rushes from place to place, and looks at the mountains from a distance, has no better conception of them than he who only crosses the Channel has of the sea.

Had the walk been monotonous, which it was not, the view from the summit, over 12,000 feet high, would have rewarded us—Macugnaga at our feet, Monte Rosa, the Lyskamm, Castor and Pollux, the Breithorn, the Matterhorn, and other peaks around us. The Italian side presented a number of small peaks projecting above a smooth sea of green haze interspersed with fragments of cloud. But the most interesting sight to me, and but for which I should not have said so much concerning this little trip, was the remarkable haze round the sun. A pink glow extended for some twenty degrees around the sun, and at the extremity of this glow was a vivid and well-defined red ring. If ever I admired my deadliest enemy, I did then; and it is my deadly enemy. This phenomenon seems not to have been seen in Switzerland till this year, and has been put down to the volcanic dust emitted during the Krakatoa eruption, the same cause put forward (with something more than mere plausibility) for the sunsets of last year. That it is due to suspended particles of some character is certain, but further than this

W. GRIGGS, PHOTO-LITH.

C. PURDON CLARKE, COPYRIGHT.

JEYPORE PALACE. THE TOWER OF THE WINDS.

PATENT OFFICE LIBRARY

I will not venture to express an opinion. On every clear day we have had here, this peculiar haze has been more or less apparent; and the more strongly it has appeared, the more difficult has it been for me to get on my plates anything that one could say with positive certainty is truly coronal. The less of this haze round the sun, the better have been my results. M. Loppé, a well-known painter of glaciers, and a member of the Alpine Club, told my friend, the German artist, here, that his "effect" of the sun behind the Matterhorn would be considered false by those most capable of expressing an opinion, if it was not carefully labelled "The Matterhorn, in 1884."

I can generally find an hour, sometimes two hours, to spare before dinner, and several times have I had shots at the mountains, or, by walking up to the Gugel, only forty minutes' distance, taken a picture of the Findelen Glacier. As I have already said, most of my first attempts were failures. It is very provoking to take out half-a-dozen plates and not obtain one passable negative. The mountains are so bright compared with the foreground, that it was some time before I could decide what exposure to give. "Expose for the shadows, and let the high lights take care of themselves," says the good old advice, which I followed faithfully in England, with very fair results last year. I tried to follow the same advice out here, but the high lights would not take care of themselves. I could not prevent reversal of the high lights, and consequently obtained very thin negatives. I gave quicker exposures, and then obtained better results. Mr. Donkin, whom I met here, says that he cannot expose too quickly for the snow mountains, and I can fully endorse his experience. Now I expose for the high lights and let the shadows take care of themselves; and they take care of themselves very well. When the sun is shining, the foreground is well enough exposed to yield sufficient detail and ample sparkle.

I have had some very amusing experiences in attempting to photograph the goats and other livestock here. The goats were rather shy at first, and we had to spend some time, trouble, and salt to tame them. They are too tame now, and one old goat comes rubbing round my tent when he is least wanted. A little salt strewn on the rocks at the base of the Riffelhorn after we have coaxed the goats to the desired spot, and we soon get their portraits. One day I walked up to some cows that were standing in a good position, and planted my camera. Instead of moving off as cattle generally do in England, their curiosity induced them to examine the camera, and I had to beat a retreat. This happened several times, till at last they got used to it, and then came my chance. With the aid of Mr. Jackson and the artist, a cow was actually posed on one occasion, and successfully taken when a hand was held up to induce her to look in the right direction for two seconds.

As I stated in my last, we went for a little excursion on the glacier one afternoon. The "we" consisted of Mr. Jackson, who was helping me here for a few weeks, myself, and the Junior Partner; the Junior Partner carrying the apparatus. The Junior Partner, I may mention, is a young lad engaged by the German artist already mentioned, to carry his apparatus, and as the day was not only dull, but even drizzling, his services were not required for his legitimate duty. He is a sharp, intelligent boy, willing and good-humoured. When he marches along with easel and canvas on his shoulders, and comes to a picturesque spot, he turns to the owner of the paraphernalia he is carrying, and says, "Let *us* paint this," or "Let *us* paint that," like the Irish organ-blower who told the organist, "How well *we* played to-day." Hence arose the nickname of "The Junior Partner," a title he is rather proud of. The Junior Partner soon took us down to the glacier, and brought us to some good crevasses, which I proceeded to take stereoscopically. The dull day softened down the contrasts of light and shadow, and some very successful negatives were the result. We soon found that the Junior Partner was a very important individual, for not one photograph was complete without him. It is true that we did not always think so, but there was no misunderstanding the Junior Partner's opinion on the subject. No sooner was a camera pointed, than he proceeded to the place himself in a direct line with the lens, unless he was directed to some other spot, or else he proceeded to climb on to the topmost pinnacle overhanging a dangerous crevasse. On several occasions we expected to see him fall down and hurt himself, but I now know that to be impossible. He said that he could take us back to the hotel by another way than that by which we came, and he kept his word.

I have solemnly sworn never to go that way again with less than ten guides and a thousand feet of rope. Climbing the Riffelhorn was child's play compared with it. We had the satisfaction afterwards, though, of showing the bunch of Edelweiss that we had plucked in plenty from the places where few save natives cared to look for it. But to do the Junior Partner justice, so far as his desire for being photographed is concerned, there is very little hardship in having to introduce an intelligent boy into a picture, and one of my little stereos, representing a pool of water in front of a cave in the ice, derives what little merit it may possess, to the presence of the boy sitting on the rocks in the foreground.

Of course I have climbed the Riffelhorn; it furnishes a nice little constitutional before dinner. On the first occasion I went with a guide and rope, and I have an elegant—well, perhaps, *not so very* elegant—*souvenir* of that event in the shape of a bad photograph of myself and the other venturous spirits who made up the party. I have not been up the Matterhorn; I intend to wait till they run a carriage road or railway up it, blow off the top to make it flat, and put a railing round.

"All work and no play makes Jack a dull boy." I have now told you all about my play—play which has not been obtained at the expense of my work. The work is going on as satisfactorily as cloud and haze will permit, and I hope to tell my readers something about it shortly.

Notes.

When Mr. C. Purdon Clarke read his paper on the "Street Architecture of India," before the Society of Arts, he showed a series of characteristic photographs upon the screen, and of these photographs, which have already been alluded to in our columns, two are presented this week as a supplement to the PHOTOGRAPHIC NEWS, Mr. Griggs, of Peckham, having made the prints by photo-lithography.

"The Tower of the Winds at Jeypore," says Mr. Clarke, "is placed at one angle of the great palace, and almost entirely constructed of stone, has open lattice work in its multitude of projecting windows, affording, in the interior, the combined open air and shade so necessary in such a climate. The shops on either side are built against the palace wall, and where they and the other buildings occur the monotony is relieved. Similar shops extend along the whole front of the palace, which, except at the large gates, would otherwise present a frontage of bare walls, of great height."

The second picture—"A Merchant's Dwelling over a Shop, Amritzar"—shows strikingly the elaborate architectural detail which is sometimes lavished upon buildings erected for trading purposes.

It must not be forgotten that the latest time for sending in pictures to the Pall Mall Exhibition is nine o'clock on next Thursday week, the 25th instant.

Painting portraits on silvered glass—in fact, on an ordinary mirror—is a Royalty-honoured fad of the present day; but few photographers know how well a carbon print looks if developed upon the surface of a looking-glass.

In making the carbon print it is advisable to avoid wetting the back of the glass—a very easy matter to arrange, if care be taken. As, however, it is necessary to cover a picture of this kind with a plain glass, it is an excellent plan to make the carbon print on the plain glass, and then to mount this glass over the mirror; the picture being between the two. This mode of working does not necessitate the use of a reversed negative.

Artemus Ward had a curious theory that a comic paper should sometimes contain a joke; but his countrymen of the present day do not seem to think with the genial showman, if we may judge by a parallel case. The late meeting of the American Photographers' Convention at Cincinnati, at which, to quote the president of the Chicago Association, "*not one word was spoken about photography*," must have been a curiosity in its way. Photographers travelled hundreds of miles to be present—there was one even from far-away England—to see a vast store of photographic sundries, and attend solemn meetings to discuss—not the art and science of photography, but—prices.

Nevertheless they were nearly let in for a bit of knowledge from an unexpected source. The English photographer, Mr. A. L. Henderson, in the innocency of his heart, offered to give a demonstration of emulsion making. This would never do. Why, photographers would be making their own plates next: then what would become of the stock-dealers?

Even the exhibition of pictures was not unadulterated with trade. The chief exhibits were there only for the purpose of showing the merits of various makers' dry plates, and the greatest attraction in the whole bazaar was a model—a very beautiful young lady draped in Greek costume—who was hired to pose before a manufacturer's stock of backgrounds—to teach the modest citizenesses of the States how to conduct themselves when they go to a photographer's, we suppose.

How different all this is to what is done in England! How slow we are! how behind the times! We are so jealous of introducing anything like "shop" into our exhibitions that, although new designs in apparatus are allowed to be shown, nothing like a display of tools is tolerated, and anything in the shape of an advertisement is removed by the ruthless hand of the Secretary; while the wildest imagination would never suggest the exhibition of a real live young lady, however beautiful, with or without a Greek dress.

It is proposed to raise a fund to defray the cost of a memorial to the late Rev. F. F. Statham, vicar of St. Peter's, Walworth, and well known to photographers as the President of the South London Photographic Society. It is not yet decided what form the memorial—which will be placed in St. Peter's Church—is to take.

Those who have been troubled by the deterioration of plates where in contact with the packing paper, or even near it, will be interested in knowing that Mr. H. J Newton, of New York, has found sodium hyposulphite in samples of cardboard and paper which damaged plates. A grooved box made of cardboard containing hypo, ruined plates in the course of eight months. It is clearly the duty of plate makers to give attention to these matters, as original packages of plates are often kept for months before being used.

How, then, should plates be packed? Mr. Newton not only asks this question, but endeavours to answer it; his own recommendation being either to use grooved tin boxes, or to keep the plates separate by means of cord or string, after the fashion of Mr. Harrison.

Curiously enough, those who devise clever methods of keeping dry plates from contact with each other, assume the need of separating the plates. If, however, they are simply laid on each other, so as to form a solid block, and tightly wrapped up so as to preclude all possiblity of any grinding action taking place, it is a very rare thing for the films to be damaged during a journey, and the probability of mischief from impurities in the packing material is reduced to a minimum.

If the Czar of all the Russias is fond of collecting photographs, he must be in possession of a most comprehensive assortment of the portraits of his loyal Polish lieges, for no one, it seems, was admitted to the enclosed ground on which the grand review was held at Warsaw who could not produce at the barriers a ticket of admission endorsed, so to speak, by the photographic presentment of its bearer. The Warsaw photographers, it is said, highly approve of this precautionary regulation; but the loyal lieges aforesaid, according to the feeble joke of an English correspondent, regard it as a new tax on their devotion, or, at all events, as a new kind of municipal rate—a "port-rate," that is to say.

Messrs. Benque and Kinderman, of Hamburg, and Fritz Eilender, of Cologne, take the gold medals of the Berlin Society this season, and silver medals are awarded to Haufstängl of Dresden, Dreesen of Flensburg, Möller of Barth, Wettern of Hamberg, Schüren of Hamburg, and Gaillard of Berlin.

A correspondent writes: "In last week's PHOTOGRAPHIC NEWS Mr. J. H. Jennings commences his letter to you with the statement 'French triplets cost 9s.' If this be so, sir, triplets are evidently one of the things they do *not*

manage better in France, for in this country, need I remind you, any well authenticated 'English Triplets' are worth £3.—Yours, &c., A mother who has received the Queen's Bounty."

Occasionally the surface of a gelatino-bromide negative is so smooth as not to be marked by the retouching pencil. In such a case it suffices to dip the plate in a solution of sodium silicate and to allow it to dry. One part of the dry silicate in thirty of water, or one of the thick syrupy silicate and twenty-five of water, gives a solution of a convenient strength.

The secretary of a well-known London Charity has taken time by the forelock, and announces for next season a Fancy Fête, for which the Albert Hall is to be turned into the semblance of the beach of a fashionable watering place. There are to be bathing machines, "pools" in the rocks, donkey-riding, nigger minstrels, a special brand of seaweeds, &c., &c.; and last, but not least, a number of active peripatetic photographers, who, from the way they will pounce on the visitors and compel them to be photographed for the good of the cause, will be doubtless well up in the use of the "instantaneous drop."

A Paris photographer offers a year's subscription to a comic weekly as an inducement to sitters; but the prize is only given to those who take at least twelve portraits and pay cash.

Sculptors should always have their work photographed. Owing to the late closing of the Grosvenor Gallery, Mr. Robert Barrett Browning found it impossible to send his statue of Dryope and her Serpent to the Brussels Exhibition within the period fixed. The Brussels authorities, however, happened to see a photograph of the statue, and were so struck by the merits of the latter, that they unanimously resolved to grant exceptional leave, and let the original in after other works were stopped.

According to the *California News*, it is only when Mrs. Langtry's face is mobile that its beauty is apparent. "It is," adds the critic, "a face wholly out of the domain of photographic art." We should prefer the opinion of the thousand and one photographers to whom the lady has sat

The mention of the popular actress reminds us that photography has certainly something to do with the prevailing tendency of actresses to change their costumes so repeatedly during a performance. Every different dress means a new photograph, and each new photograph an additional advertisement both for the actress and her *modeste*. Many ladies now go to a new play merely to see the heroine's series of elaborate costumes. A modern comedy might be appropriately announced, in fact, as being "in four acts and nine dresses!"

A photographer, staying at a watering-place on the East Coast, was much struck with the picturesque costumes of the fishermen, and arranged with a couple to make a series of studies. But he omitted to lay especial stress on the fact that they were to come in their work-a-day dress, and he was aghast to see two brawny fellows appear with clean faces, well-oiled hair brushed neatly into the corners of their eyes, flaunting blue and red satin neckerchiefs, and ordinary—very ordinary—coats and trousers. The worst of it was, the poor men were quite disappointed to find they were not to be photographed in their Sunday clothes! Why anybody should want pictures of them in their fishy jerseys and oilskin sou'westers they couldn't understand.

Patent Intelligence.

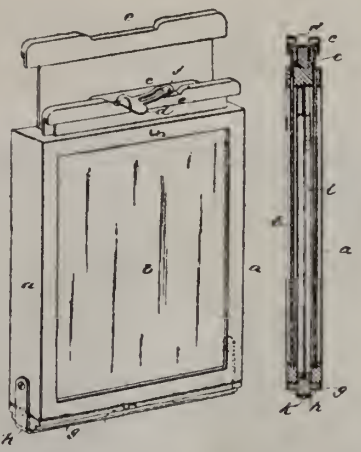
Patent Granted in America.

304,112. WILLIAM H. LEWIS, New York, N. Y., assignor to E. and H. T. Anthony and Co., same place, "Plate-holder for cameras."—Filed May 2, 1884. (No model.)

Claim.—1. The fastening for double-plate holders consisting of a clip arranged to fasten both shutters, and having a side movement sufficient to release either shutter while retaining the other in place, substantially as described.

2. The fastening for shutters of plate-holders, consisting of a clip fitted to slide on the frame of the holder, and pivoted to turn at either side for releasing one shutter, substantially as described.

3. In a plate-holder, the slotted T-shape clip *d*, combined with the shutters *b*, having recessed ends substantially as described.



4. In a plate-holder, the pivoted plate *h*, combined with the cap *g* of the holder, substantially as and for the purpose specified.

5. The pivoted fastening-plate *h*, apertured at *i*, combined with frame *a* and cap *g*, having a pin, *k*, as specified.

HOW TO PHOTOGRAPH MICROSCOPIC OBJECTS.

BY I. H. JENNINGS.

LESSON IV.—EXPOSING THE PLATE.

No rule can be laid down as to the duration of the exposure. It depends (1st) on the focal length of the lens used; (2nd) its aperture, wide-angle lenses being far quicker than those of low-angle; (3rd) the nature of the light used; (4th) the nature of the object, yellow and brown objects always requiring a prolonged exposure; (5th) the development. An operator who uses a weak developer will always expose his plates for an unnecessarily long time. The beginner will perhaps think the exposure the most difficult part of photo-micrography, but as he progresses he will alter his mind, and think the proper illumination of the object far more difficult.

Using a good paraffin lamp, and lenses of from 5 inches to $\frac{1}{16}$-inch, the exposures may vary from a fraction of a second to half an-hour. For instance, the larva of a flea, a very transparent object when properly illuminated, will not require more than half a second with the 2-inch objective; while with the same lens, a section of coal may require twenty minutes. The section of Alveolina lime-

SECTION OF ALVEOLINA LIMESTONE, HERAULT, BELGIUM.

stone figured below, although of a white colour, and apparently very transparent, had an exposure of fifteen minutes. As a rule, all rock sections will require a rather long exposure, as they stop a large amount of light. All sections

WING OF MIDGE (PSYCHODA).

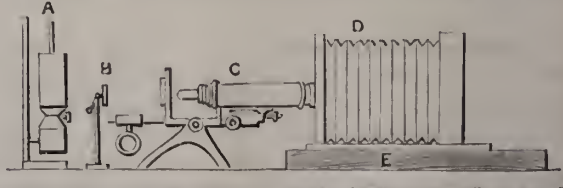
should be as thin as possible; yet a good colour is of more importance than thinness. The writer has a section of a tertiary limstone from Bengal, of a strong yellow colour, which he has often vainly tried to photograph satisfactorily, although the section is most admirably cut, and very thin.

The wing of a midge, here shown, will serve as a good example of a very transparent object, which yet has plenty of detail. This object had an exposure of one second: less would have sufficed with a more powerful lamp.

High powers, being used chiefly with very transparent objects, do not require the tremendous exposures that people generally imagine. A $\frac{1}{16}$-inch, when properly illuminated, will give a good clear image on the focussing screen five feet away from the object. When the writer first began using high powers, he heard such exaggerated statements about the difficulty attending their use, and the long exposures they required, that on first trying *P. angulatum*, he gave an exposure of an hour to this transparent object. On developing, the plate came out almost clear glass; only a faint ghost of the object could be seen on the plate. A subsequent exposure of fifteen minutes, under the same conditions, gave a fair negative. All objects are not fitted for photography, therefore it may be taken as a rule that if any object bears an exposure of half-an-hour with any lens, without being fully exposed, it is simply useless to attempt it. There is a little scarlet mite common in gardens, the scarlet Trombidium, which, owing to its colour, may be exposed for almost any period without getting any better photograph than a blank outline. Such objects should, if possible, be bleached before attempting to photograph them.

When magnesium ribbon is used as the source of light, the exposures become very rapid. The writer has never used this light with low powers, but he has found ten seconds to fifteen seconds ample for diatoms with the $\frac{1}{16}$-inch objective.

The dry plates recommended for photo-micrography are the most rapid in the market. The writer has used Swan's ten times collodion, and thirty times collodion; and while the ten times are excellent for low powers, he still prefers the thirty times plate for every purpose. He has also used plates still more rapid, and found them satisfactory in every way. Very rapid plates are often difficult to manipulate when used for landscape work, but when used for photo-micrography they become as easy to develop as any slow plate, while they have the great advantage of increased rapidity. The writer is not alone in advising the use of rapid plates, for the author of "Practical Microscopy" has obtained good results on Swan's fifteen times plate, while Dr. Sternberg, one of the most experienced and accomplished of living photo-micrographers, uses Eastman's instantaneous dry plates. The maker of the plates is of little importance. The writer has tried most of the makes in the market, and has got good results with all. The chief thing is that the plates be made of good hard gelatine. If a sample of plate be found to be prepared with soft gelatine, reject it at once. Frilling may be laughed at, but shrinkage of the film is simply ruin to all good work.

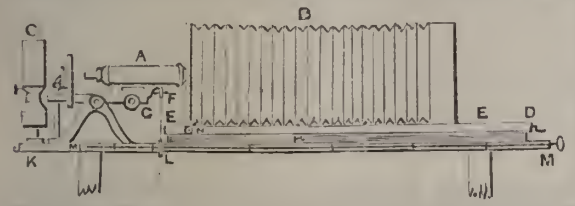


ARRANGEMENT OF MICROSCOPE WITH SHORT CAMERA FOR USE WITH EYE-PIECE.

A, lamp; B, condenser; C, microscope; D, short camera; E, block to support camera.

We come now to the actual exposure of the plate in the camera. First place the object on the stage of the microscope, choose your lens, and bring the object into focus. Notice carefully the chief points that you wish to be shown clearly in the photograph, that special attention may be paid to them in focussing and exposing. Then lay the microscope in the horizontal position, place the lamp in

front, and adjust the illuminating apparatus in the best position. The object may be seen best with oblique light: in this case be very careful, or the plate may not be fully illuminated, when the negative would be rendered worthless. When the illumination has been satisfactorily adjusted, draw the front of the camera up until the eye-piece of the microscope fits in the hole made for its reception. A hood of black velvet will probably be necessary to render the connection of camera and microscope light-tight. This done, view the object on the screen, which will be very indistinct. If the adjustments of the microscope are within reach, by their means slightly withdraw the lens from the object until the latter is in good focus. If the eye-piece be removed, and the adjustments are, therefore, out of reach, by reason of the length of the camera, turn the focussing rod until a satisfactory focus be obtained. When this is accomplished, leave the apparatus for a few minutes to allow of its expansion from the heat of the lamp. With



ARRANGEMENT OF MICROSCOPE WITH LONG CAMERA WHEN THE EYE-PIECE IS NOT USED.

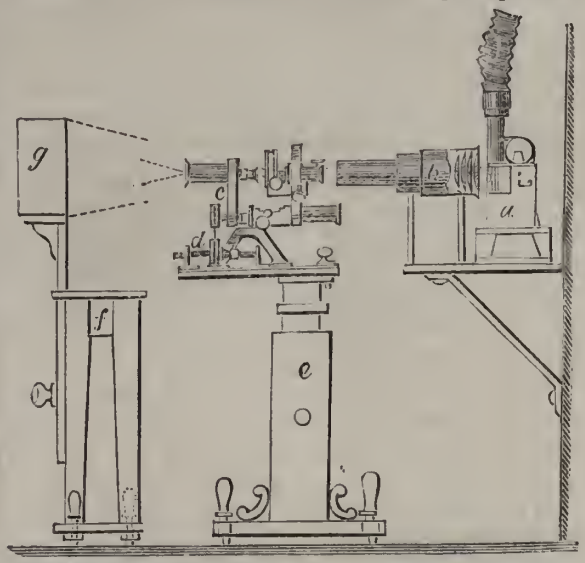
A, microscope; B, camera; C, lamp; D, winch screw; E, base-board; F, fine adjustment; G, band connecting F with wheel of rod, L; H, block supporting camera; K, table; L, wheel of focussing rod; M, focussing rod; N, rack-and-pinion for moving camera front.

low powers, this expansion is hardly likely to affect the results, but with high powers is very injurious.

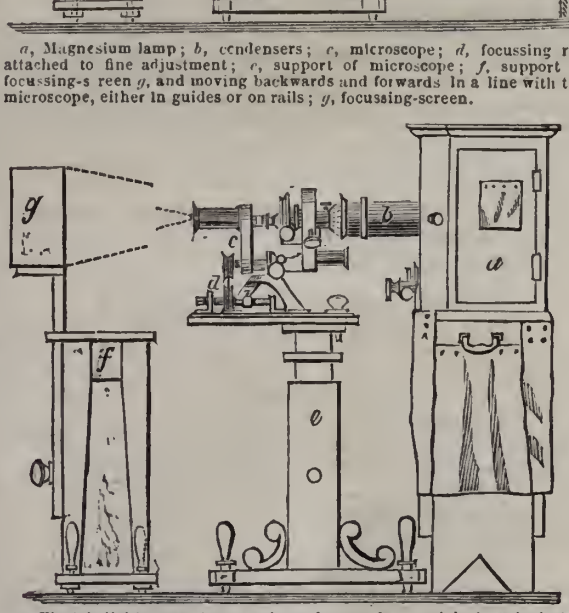
Sometimes, in fact, when using a high power, the expansion of the metal parts of the apparatus during a long exposure may be so great as to throw the object quite out of focus. It is thus advisable to place the lamp as far away from the microscope as possible, consistent with suitable illumination. The writer frequently uses a card-board screen between the lamp and microscope, with an aperture to allow the rays to pass through. By this means the microscope is kept cool, and possible injury to the lens and object averted. The alum cell, used with the heliostat to stop the heat rays, can hardly be used successfully with lamp-light. Sometimes, however, a thin cell, containing ammonio-sulphate of copper, may be employed when photographing very transparent diatoms, and answers the double object of keeping off the heat from the lamp, and giving a more diffused light. For the latter purpose, with low powers only, a strip of fine ground glass or oiled paper may be placed beneath the object. A slide of blue glass, 3 inches by 1 inch, is also used by some operators for softening the light.

All being ready for an exposure, a blackened card must be placed opposite the lens, or below the stage, to cut off the light. With a low power, the card should be in front of the lens. The dark slide may then be inserted, and the shutter drawn up. After waiting for a few moments to allow all vibration to cease, the card in front of the lens must be rapidly removed. During the exposure, the operator must abstain from walking about the room, for the vibration so produced would injure the sharpness of the picture, more especially with low powers and short exposures. When the exposure is deemed sufficient, the blackened card must be replaced in front of the lens, and the shutter pushed down. If other exposures are to be given, do not turn the lamp down, but leave the flame the full height, until the next plate can be inserted in the camera. In this way the alternate expansion and contraction of the microscope, &c., is avoided. If, on developing, the first negative be found either over- or under-exposed, try again, without disturbing the apparatus.

The two following figures illustrate the method adopted by some workers of using the microscope in a dark room, and thus dispensing with a camera. If the student have sufficient room at his disposal, and can fit up an apartment



a, Magnesium lamp; *b*, condensers; *c*, microscope; *d*, focussing rod attached to fine adjustment; *e*, support of microscope; *f*, support of focussing-screen *g*, and moving backwards and forwards in a line with the microscope, either in guides or on rails; *g*, focussing-screen.



a, Electric light apparatus: an incandescent lamp might be substituted with advantage. The other letters same as in the figure above.

specially for his work, perhaps this arrangement is the very best that can be used; it is, however, hardly suited to beginners. The references to each figure will suffice to explain the general arrangement of the apparatus.

NOTES FROM NEW YORK.

KEEPING QUALITIES OF GELATINE PLATES — REDUCING INTENSE NEGATIVES—AN EASY METHOD OF PREPARING NON-ACTINIC GLASS FOR THE DARK-ROOM.

THE keeping qualities of gelatine plates as they are at present packed in packages by manufacturers was recently discussed at the Society of Amateur Photographers by Mr. H. J. Newton, and some of the results explained by him will doubtless enlighten many who have been troubled with unaccountable fogginess in plates. He showed several specimens which supported his discovery. One plate had been kept in a cardboard box for over a year with straw-board paper frames about ¼-inch in width laid between it and the

other plates. On development, a rim of fog appeared where the paper frame was in immediate contact with the film, and extended inwards nearly an inch towards the centre. A year ago, when the same plates were first obtained from the manufacturer, clear and brilliant negatives were obtained. The effect thus shown proved conclusively to Mr. Newton's mind that there was something in the paper frame which exerted some injurious action upon the sensitive film. After two or three careful experiments, he found the frames completely loaded with hyposulphite of soda. Other specimens were exhibited where the plates had been packed in grooved cardboard boxes. The box was found to contain hypo, and in the course of six or eight months the plates were so badly affected as to be worthless. In another case the sensitive film had been made insensitive to the action of light by the action of the cardboard frame. The developer would not turn that portion of the film after exposure to light, and it was transparent after fixing in the hypo. Another curious effect was the precipitation of metallic silver over portions of the plate in streaks, and in a rim half-an-inch wide around the plate. To the amateur who might wish to take an extended trip, covering one or two years' time, the discovery of the probable deterioration of his plates due to want of care on the part of the manufacturer was demoralizing. Even packing plates with strips of white wood laid between them at their ends Mr. Newton claimed was not safe, as in the making of collodio-bromide dry plates, white wood was proved to have exerted a deleterious effect. Two methods of packing were recommended: first, to use grooved tin boxes; and second, the separation of the plates by a cotton cord running alternately at each end between each plate, and known as Wheeler's Patent Method. A collodio-bromide plate had been kept in a tin box by Mr. Newton for three and a-half years without any deterioration whatever.

Several formulas for reducing over-intense negatives were given at the same meeting. Mr. Beach recommended the following, which had been sent him:—

Water	5 drachms
Chloride of gold	15 grains

The plate is soaked in water, and then flowed over with the gold solution; it is then well washed, and laid in a bath of cyanide of potassium (water 8 ounces, cyanide 20 grains). The action proceeds gradually, and the reduction is under perfect control, one advantage being that the details in the shadows are not obliterated. Mr. Newton recommended the following as being much cheaper:—

Water	10 ounces
Sulphate of copper	100 grains

After this is dissolved, add

Bromide of potassium... ...	100 grains

Lay the negative in a bath composed of one ounce of the above in six ounces of water, watch closely, then wash, and finish with a weak solution of hypo. Another formula was to substitute a perchloride of iron solution very weak (5 minims of iron solution to 10 ounces of water) for the bromide of copper solution, and finish with a weak hypo bath. Dr. John Janeway had had much success with the following:—

Ferridcyanide of potash (red prussiate)	9 grains
5 per cent. solution hyposulphite soda	3 ounces

Dissolve the potash by stirring with a glass rod. This amount will cover a 5 by 8 plate, and can be used for three or four plates, but only on the day it is mixed. The action of the solution is quick, and it should be watched carefully. When reduced to the desired degree, the negative is simply washed and dried. Intense portions of a dry negative may be reduced by touching them over with a camel's hair brush previously dipped in the solution. After each application the plate should be washed.

A simple yet perfect method of making a non-actinic glass for the dark room was explained by Mr. Newton, and specimens were shown which attracted attention for the brilliancy and clearness of the colours.

He took a pane of deep orange (pot orange) glass, and coated it with negative varnish in which was dissolved an aniline green, called "new green;" the resulting colour, when viewed by transmitted light, was a deep clear olive green, which was perfectly non-actinic, and made a very pleasant light to work by. A clear pane of glass, coated on one side with an orange-coloured varnish, and on the other with "new green," would accomplish the same result. Any desired opaqueness or transparency could be obtained by varying the amount of colour added to the varnish, or by coating the plate with one or more films.

The annual Field Day Excursion of the Photographic Section of the American Institute occurs on the 28th inst., and Coney Island is the objective point; the day's work to end in the afternoon with a dinner and addresses, at Hotel, Brighton.

The second Field Excursion of the Society of Amateur Photographers is projected for September 10th, to Mauck Church and Ornoco Glen, Penn., locations noted for fine scenery. Mr. A. L. Henderson, of London, is expected to speak before the Society at their regular meeting on September 9th. The event is looked forward to with much interest. THE AMATEUR PHOTOGRAPHER.

New York, Aug. 23, 1884.

PROFESSOR VOGEL'S AZALINE PLATES, AND THE ISOCHROMATIC PLATES OF ATTOUT AND CLAYTON.

BY DR. J. M. EDER.

On the occasion of Professor Vogel's recent visit to Vienna, some experiments with azaline plates were made in his presence. The trials were carried out with plates from the factory of Perutz, in Munich, and from that of Sachs, in Berlin; and it is of interest to note that Löwy and Plener were present during the experiments.

Oil paintings, chromo-lithographs, and colour scales were photographed, and in front of the objective was a yellow screen or pane. The development was with ferrous oxalate.

The azaline plates, when examined before development, showed a reddish colour, but this tint became less intense during the development and fixing.

The finished negatives showed the yellow, the yellowish-green, and the green of the original as more intense than the blue and the violet; indeed, the negatives were obtained with all the gradations of the originals correctly reproduced.

The Attout and Clayton plates were exposed under similar conditions; and although they appeared to be more sensitive, there was a tendency to fog, while the azaline plates gave perfectly clear negatives.

QUICK AND SLOW DEVELOPMENT.

BY DR. C. STURENBURG.*

Very many persons who have attentively studied the various points relating to photographic operations have recognized the fact that slow development has very decided advantages over rapid development, although the stronger, and therefore more rapidly acting, developer may require a somewhat shorter exposure than is the case when a weaker developer is used; and these remarks may be considered as applicable not only to the dry process, but also to the wet.

More especially is it to be noted that a weak developer works much more cleanly and uniformly than a strong one; indeed, to use a strong developer successfully requires a very experienced hand when it is essential to obtain good clear skies in large landscapes; but with a weak developer this is quite easy. Moreover, in the case of a slowly-developed picture there is greater harmony as regards the gradations of the tones, this being especially notable in the case of

* Translated from the *Deutsche Photographen-Zeitung*.

interiors. This is probably the case because (assuming the exposure to have been correct) the dark parts have more time to develop, and it is easy to frequently pour on a fresh developer, and one need have no fear that the lights will become too intense and hard.

For all this, cases may arise in which a slow development is required in order to obtain hard images, as, for example, in the case of line subjects; but in such instances the developer must possess a special constitution; that is to say, it must be far more acid than when portrait or landscape photography is concerned (wet plate). A weak developer, constituted with excess of acid as above, gives a much finer deposit of silver than a strong developer; this being a consequence of the slowness with which the metal is precipitated. For this reason transparent positives which are intended for enlargement are much better when developed slowly.

In the modern dry process the same appears to hold good, although the conditions of development are widely different.

THE CAMERA AS A SURVEYOR.

OUT-DOOR photography, as formerly practised, was exceedingly cumbersome, and was only used by the professional or by the amateur who had plenty of time and money. The work of sensitizing, exposing, and developing the plate was of necessity done in the field. This made a dark-room on wheels of some sort and a considerable assortment of chemicals and apparatus a necessity. The cameras were heavy and burdensome. To the mass of people the whole subject was a black art, which some were inclined to class with necromancy.

The introduction of the various forms of dry plate, of which the "gelatine" now takes the lead, has wrought a complete revolution in the whole practice of out-door photography. Excellent plates of a known degree of sensitiveness can now be purchased. The methods for developing and fixing the image have been so simplified that a person of ordinary intelligence, "by following directions," can, after a few trials, make a fair negative. These improvements have stimulated instrument makers, both of cameras and lenses, to produce an apparatus which shall be at once cheap, light, substantial, and efficient.

There are other features worthy of mention, one of the most important of which is that there may be an interval of months between the exposure and the development of a gelatine dry plate. A couple of years ago Mr. Edward L. Wilson exposed some thousands of gelatine plates in Egypt and the Holy Land, which were brought to this city, and developed and fixed by appropriate chemical treatment. The resulting pictures were as clean and bright as if the process had all been continuous.

As is generally known, the photograph or positive picture on paper is printed by placing it under the finished negative and exposing to the light. The usual processes are "the silver," "the platinum," "the carbon," "the argentic gelatino-bromide," and "cyanotype." The first four are somewhat complicated, but the last, the cyanotype or the blue print, is exceedingly simple. The cyanotype paper is placed in a frame over the negative. After a proper exposure, which can be determined by a little experience, the paper is floated upon a dish of water, sensitive side down, for fifteen or twenty minutes, after which it is washed in repeated changes of water and then dried. The resulting print is in a deep blue, and is very durable. A picture can thus, on a bright, sunny day, be produced inside of an hour and a half.

The "argentic gelatino-bromide" printing process, although more complicated than that just named, is the most rapid of all. The time required for the exposure of the sensitized paper under the negative is in daylight from one to two seconds, and in lamplight from ten to twenty. The image is developed and fixed by chemical means. This can be done in five minutes. The resulting picture is clear, permanent, and brilliant. This process is the only one for the production of paper positives, which can be satisfactorily used in the night time.

The great improvements to which we have referred have enlarged the scope of photography and rendered it an important auxiliary in many and diverse enterprises. Indeed there is scarcely a branch of history, whether it be in art, in science, in mechanics, in business, or agriculture, where the camera cannot serve some practical end. It is our purpose to call attention to some of the ways in which photography can be made to serve the fire underwriter.

It will give the general appearance of many large risks, showing clearly the relation of one portion of the property to another or to contiguous buildings. The various approaches can be shown, as well as details in the buildings. A very fair notion may be got of the construction and arrangement of machinery and of boilers, furnaces, and accessory apparatus, which will aid in determining the character of the risk. The extent and value of the property, from views taken inside and outside, can be estimated, and over-insurance guarded against. The fire extinguishing appliances, such as force-pumps, stand-pipes, hose, &c., can be shown if desired. Through information thus obtained the managers at the home office can determine as to whether or not a proper rate has been charged. If changes are made in the building, in the stock, or storage of goods, photographs will aid in showing the effects such changes have upon the risk. In cities and large towns bird's-eye views from elevated points will give a pretty good idea in regard to the situation and location of the properties which are specially hazardous by reason of the material employed in, or the manner of their construction, or the uses to which they are put. In case of a claim where the proofs are not satisfactory, the camera will aid in indicating the extent of damage done to the buildings and possibly to the contents. When fraud is suspected, the place where the fire originated, and perhaps the manner, can sometimes be shown. In the event of litigation, photographs might be extremely valuable They are mute, but exceedingly veracious witnesses.

The suggestion that every inspector, adjuster, and agent doing a considerable amount of business should have a camera and be able to take views, is worthy of consideration. An ordinarily intelligent man can be taught in a few hours to do this. After exposure the plates can be sent to the home office, or to a photographer, if need be, for development and prints.

The camera, which would probably be most useful for this purpose, is one in which a picture can be taken 5 inches by 7, 5 by 8, or 6½ by 8½. Probably the smallest size would fill nearly every practical need. The cost of the apparatus would be from £12 to ten times that amount. If the scheme we have suggested should take practical shape, companies could secure instruments and prepared plates of excellent quality, uniform in size and finish, at very reasonable rates. In uniformity there would be the practical advantage that, if one dimension in any view was given, a pretty fair estimate could be made of all the sizes and distances in the picture.—*The United States Review.*

Correspondence.

PHOTOTYPE BLOCKS BY THE IVES' PROCESS.

DEAR SIR,—In justice to ourselves, I beg of you to point out to your readers that the beautiful supplement to your last issue from a photograph by Ives' process *has been printed from the stone*, where it is very easy to put in all those lights in the trees, &c.; whereas you print our plates with the letter-press on your ordinary paper, which makes all the difference. It would also be interesting to know how long it took to produce the plates, and at what price they can be supplied.—Yours faithfully, E. PICK.

Meisenbach Co., Limited, 31, *Farringdon Street*, *Sept. 6th.*

[The supplement by the Ives process which we issued last week was not printed from stone, as our correspondent appears to think, but from a typographic block; and as regards the suggestion of Dr. Pick that the excellence of the print is partly due to something of the nature of retouching, we may quote from Mr. Ives' letter to us of August 1st. He says:—"The subjects are not of a 'showy' character, and were turned out in the regular course of business, and *finished without* any retouching. They are *fair* samples of our commercial work, not better than we average from equally good copy." It is but just to Mr. Ives to mention that some few weeks before he sent us the supplement, we received from him a considerable number of subjects of equal excellence. On previous occasions, Ives' blocks have been printed along with letterpress in the PHOTOGRAPHIC NEWS (the first in 1882), and on one occasion a Meisenbach block-print was issued as a separate supplement; so each process has been presented to our readers under the two several conditions. It is curious to

note that when our separate supplement by the Meisenbach method was issued (Nov. 23rd, 1883), certain persons loudly asserted it to be a lithograph; but their mistake, like that of our correspondent, doubtless arose from the fact of the grain of the highly-rolled paper being somewhat raised by contact with the damp sheets of the recently printed reading matter. Any person who is familiar with printing, and who inspects prints which have not been laid in the damp copies of the PHOTOGRAPHIC NEWS, can see at a glance that our Meisenbach Supplement (Nov. 23rd, 1883) and our Ives' supplement of last week are actually block-prints.—ED. P.N.]

A SODA AND POTASH DEVELOPER.

SIR,—It seems from correspondence that there is much discussion as to the best developer. I have one that I love so much that any gelatine plate that would not behave in a most becoming manner towards it, I would at once condemn and discard.

The way I proceed to develop this developer is as follows. I make saturated solutions of potash (carbonate), soda (sulphite), and soda (washing).

These I name 1, 2, 3, which means, take—

Sat. sol. of carbonate of potash...	... ...	1 ounce
,, sulphite of soda ...	... ...	2 ounces
,, washing soda ...	... ...	3 ,,

To these I add 48 grains of bromide of potassium, dissolved in 18 ounces of water, and label this—"Soda Solution."

Now dissolve a ¼-ounce of citric acid in 30 ounces of water, and add 1 ounce of pyro, and label this—"Pyro Solution."

To develop a half-plate, take—

Pyro solution	2 dr.
Soda solution	*quant. suf.*

Never soak the plate in water previous to development, as it is one cause of frilling.

Anyone who tries this developer I feel sure will value it as I do; it has every virtue, and none of the faults, of the soda or potash used alone.—I am, sir, yours truly,

HENRY LAW.

THEORETICAL STUDY OF PHOTOGRAPHY.

SIR,—The City and Guilds of London Technical Institute is the only body in London, as far as I know, which offers any incentive for the study of theoretical photography for assistants. There could be but little doubt as to the advantage it would be to the photographic world generally, should those who are assistants now—but who will in the course of time be principals—have a thorough theoretical as well as practical knowledge of their business. Some of the city companies, seeing the importance to their trade of such a knowledge, offer medals and certificates to stimulate efforts which, perhaps, would otherwise lie dormant.

Photography is not guarded by a great city company, but there is the Photographic Society of Great Britain, and many others, who might do much by interesting themselves in the matter, and take some steps to second the work the City Guilds have so well begun. Exhibitions are well to a certain extent, but offer but little inducement to assistants who, with but little spare time, and less money, are hardly likely to stand much chance when principals with leisure, and every convenience, compete at the same time.

I can say that those who, like myself, studied up for the City Guilds Examination derived great benefit from doing so; but the number was quite inadequate to what it should have been. Should the societies not see their way to do anything in the matter, I would suggest that the PHOTOGRAPHIC NEWS should offer prizes, or in some way help to advance the theoretical study of photography.—Yours obediently, WILLIAM EDWARD GRAY.

THE POTASH DEVELOPER.

DEAR SIR,—I am at a loss to know how your correspondent "J. G. R." failed to obtain satisfactory results with the potash developer, unless he did not take the precaution to obtain chemicals of absolute purity. So much impure sodic sulphite is in the market, sold at a low price, that I should imagine any developer would prove a failure if made up with such rubbish. I have used sulphite in the developer almost ever since it was recommended by Mr. Berkeley, and have found it a very excellent addition; yet only a short time ago I failed completely to satisfactorily develop several negatives, simply through using a cheap sample of sulphite, which was largely contaminated with carbonate. Formerly I had paid a good price for this salt, and had always got pure samples; so for the future I mean to eschew cheap chemicals. Then, if "J. G. R." used, instead of a strong solution of sulphurous acid, water merely scented slightly with this gas, no further factors need be found to explain the failure of the developer.

As to frilling, this occurred with the plates of only one maker, which were quite new to me. Plates by three or four other makers showed no sign of this trouble, even when alum was not used.

As regards density, I have found this quality very easy to obtain; but care must be taken not to employ too much No. 2 or potash solution, or very thin negatives will be the result. If a negative requires a little strengthening, Dr. Eder's alum and ferrous sulphate intensifier answers well. In the PHOTOGRAPHIC NEWS, June 22, 1883, page 388, Dr. Eder, in speaking of Dr. Stolze's potash developer, says that very vigorous negatives result from its use: "if, however, it is wished to obtain thin negatives, the quantity of water must be doubled." Mr. Richard Parr, in writing to the PHOTOGRAPHIC NEWS, June 13, 1884, page 379, to give his experience of Newton's "potash-soda-sulphite" developer, says:—"I find it to compare very favourably with "alkaline pyro" of the old form, giving a denser negative, with more of the old wet-plate characteristics, and takes a somewhat less exposure." He complains, however, like "J. G. R.," that this form of developer induced frilling. Apart from this, what Mr. Parr says of Newton's formula applies equally well to that of Beach.

As an example of how much density can be obtained, one day I exposed a plate with $\frac{f}{6}$ stop for one second on a small cottage with foliage up the front and trees on either side. The day was clear, with little sun. Directly the developer was poured over the plate, the image flashed out. The solution was immediately poured off, and diluted with water to twice the original volume, and a few more drops of pyro solution added. Development then proceeded more slowly, but on examining the negative before the lamp, the high lights were found to be so dense that the lamp-flame was hardly visible. This negative takes two hours to print in a good light. I have not reduced it, but keep it as evidence of how dense an over-exposed negative may become in the potash developer. Since then, I dilute the developer rather more than recommended in the formula, reduce my exposures to less than a second on all well-lighted subjects, and use a smaller stop. The lens I have chiefly used has been a small 7½ inch single landscape lens, by no means a rapid one.

I consider the potash developer more vigorous than the ordinary pyro and ammonia, simply because I have been able to make quicker exposures and use smaller stops, even on dull days, than I have ever done before; and find instantaneous pictures as easy to develop as those that have received the "full" exposure, which I could'nt say when using the old developer.

Answering "J. G. R's." queries *seriatim*, I would say:—

1. Density may easily be obtained by making up the formula with good chemicals, and using the solutions strong or dilute according to the exposure of the plates.

2. The usual method of looking through the negative at a red light will show if sufficient density has been gained. If the plate *looks* thin, it *is* thin, and must be developed out more, or more pyro be added. Thin negatives will always occur with an excess of potash.

3. The amount of pyro named in the formula is, perhaps, excessive. I always use less for an instantaneous exposure in sunshine, and get ample density. For an ordinary exposure, the usual proportion of three grains or four grains per ounce is sufficient.

4. The alum bath appears to have no reducing action. My own plan is to use alum both after development, and after the fixed plate has been finally washed. The negative is left in each alum bath about five minutes. Most of my negatives are thin, but yield vigorous prints. I have intensified only in the case of a few plates that were thinly coated, but never when using Swan's "Studio" plates. Any other good plate would give equally satisfactory results.

New developers are not always satisfactory on the first trial. When I first used the soda developer, I fancy I made a far greater failure than "J. G. R." has done with the potash. His negatives were only thin; mine were simply useless.

"Surrey's" query as to the unwholesome nature of the fumes of ammonia is answered in my last letter. Still, I may, perhaps, quote from Mr. Ashman's excellent article on "Ammonia," which appeared in the PHOTOGRAPHIC NEWS, No. 1342, page 322:—"Ammonia, when taken in quantity, is fatal to life, producing inflammation of the lungs, and stricture of the throat; frequent inhalation renders susceptible persons liable to suffer periodically from cold in the head. Such persons should not inhale the fumes from the alkaline developer more than is absolutely necessary, and whenever they feel an indication of an attack, should freely inhale the fumes of glacial acetic acid."—I am, sir, yours faithfully, J. H. JENNINGS.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 4th inst., Mr. W. K. BURTON in the chair.

Mr. A. COWAN showed a series of eight negatives developed by means of the carbonates of soda, potash, and ammonia, separately, and mixtures of these alkalies; he found a yellow colour pervaded all those where soda was employed, although sulphite of soda was used in each case. When he first used soda, he obtained yellow negatives; but as so much had been said lately in favour of this alkali alone, and with potash, he was induced to make these trials, and found that the plates were more yellow than ever. He then tried the addition of restraining bromide, which prevented his getting an image; and he said it was astonishing how little influenced the result, a fact which might be taken advantage of in cases of over-exposure.

Mr. W. E. DEBENHAM: Can the image be developed with ammonia and pyro after being checked with soda and bromide?

Mr. COWAN replied that it could.

Mr. DEBENHAM: Then that goes a long way towards solving the difficulties of over-exposure.

Mr. COWAN: Among the experiments will be found plates developed with the mixed carbonates of potash and ammonia restrained with one-tenth of a grain of bromide; these are entirely free from yellowness.

Mr. W. M. ASHMAN used soda continuously with great success, and said it was most important that an understanding should be arrived at on this question, which may rest with the difference in the plates. He suggested that Mr. Cowan should develop some of his (Mr. Ashman's) plates, and he some of Mr. Cowan's, each exposing his own. This was agreed to, and Mr. Haddon, whose soda-developed negatives were of a yellow colour, promised to take part in the trials.

The CHAIRMAN had tried caustic potash, and found, when used with ammonia, there was greater detail. He agreed with Mr. Cowan that the smallest quantity of restrainer in the soda developer stopped the developing action. He thought Mr. Derham could tell them something about soda developers.

Mr. DERHAM (Boston, Mass.) said he brought some plates over with him which he had used; they were developed with the following developer:—Carbonate of soda, 1 ounce in 10 ounces of water; oxalic acid, 30 grains; and pyro, 20 grains in 10 ounces of water. Equal portions of these were taken. Here the negatives developed intensely yellow; in America they were black, but with more pyro he could get them black here also.

Mr. J. BARKER found the shadows of the negatives developed with sulphite of soda always possessed a grey veil or fog. He obtained the best results with carbonate of ammonia, pyro, and potassium bromide.

Mr. COWAN enquired if any change had been noticed in negatives bleached with mercury; also if anyone had experience with mercury alone as an intensifier?

Mr. W. COBB had given his gelatine negatives a slight wash with a very dilute solution of mercuric chloride for some months past, and thought, besides the improved character conferred, they would be permanent.

Mr. DEBENHAM used to change the colour of wet plate negatives in that manner, and found no ill effects—an experience borne out by others present.

Mr. G. WALTENBERG found that gelatine negatives bleached with mercury were not permanent; he had several hopelessly spoiled.

Mr. BARKER said as far as the treatment of collodion with mercury was concerned, it depended on the amount of action; if the stain went through the film, then it was permanent. Referring to a recent controversy in one of the journals regarding colour in bromide plates, he said one gentleman seemed to claim it as his own property. In 1873 he produced many bromide negatives of a red colour, and now passed round two examples. In reply to the Chairman, Mr. Barker said that the method of developing affected the colour; the plates were collodio-bromide.

The CHAIRMAN had seen a variety of colours produced on those plates.

Mr. DERHAM exhibited a 5 by 4 tourist's camera, designed for taking objects in motion, and arranged to hold against the shoulder. It consisted of two bellows bodies fixed vertically to one base, and mounted with twin lenses; the upper portion was intended for focussing and watching the object by means of a bellows extension, and the lower portion, fitted with a spring shutter on the Noton principle, was used for making an exposure. Half-a-dozen double slides in zinc case to fit back of camera completed this compact arrangement.

The CHAIRMAN, in thanking Mr. Derham for showing this camera, said it would be interesting to hear something about American lenses mostly in vogue.

Mr. DERHAM then described most of the lenses used in America, and said that the English lenses were held in high favour.

Mr. TURNER was then elected a member of the Association.

Talk in the Studio.

APPOINTMENT CARDS.—Messrs. Marion and Co. forward us some appointment cards, of which the designs are exceptionally elegant. To give a sitter a written memorandum as to the time of appointment is an excellent plan; and, moreover, on the reverse of the card may be printed suggestions as to enlargements and finishing of copies in colour, together with other matter calculated to induce the sitter to go beyond his original intentions.

CENTENARY OF THE FIRST BALLOON ASCENT IN ENGLAND.—On Monday next, exactly one hundred years will have elapsed since the first balloon ascent was made from English soil. This was effected by an Italian named Vincent Lunardi, who, on the 15th of September, 1784, rose from the grounds of the Honourable Artillery Company at Finsbury, in the city of London, in the presence of a vast multitude of spectators. Since that date no balloon has been launched into space from the same spot, but arrangements have been made by the Hon. Artillery Co., in connection with the Balloon Society of Great Britain, for holding a centenary celebration of the event on Monday next, when, weather permitting, Mr. Dale and Mr. Cecil V. Shadbolt hope to go aloft in the "Sunbeam" balloon from the identical starting point from which exactly one hundred years ago Vincent Lunardi made the first ascent in England. Whether or not the trip will be a photographic one will depend upon the weather and light.

HARDENING WOOD.— Rubennick's process for metallising wood consists in steeping the wood in caustic alkali for two or three days, at 104° to 197° F. The wood is then placed in a second bath of hydro-sulphate of calcium, to which sulphur is added, after twenty-four or thirty-eight hours. After forty-eight hours the wood is immersed in a third bath of acetate of lead at a temperature between 95° and 122° F., where it remains from thirty to fifty hours. After a complete drying, the wood thus treated is susceptible of a very fine polish, especially if its surface is rubbed with a piece of lead, tin, or zinc, and finally finished with a burnisher of glass or porcelain. It then looks like a metallic mirror, and is completely sheltered from all the deteriorating effects of moisture.—*Science.*

FLEXIBLE TUBING IMPERVIOUS TO GAS.—Ordinary rubber tube is by no means gas-tight; in fact, the gas not only filters slowly through it, but the rubber absorbs and stores up several of the denser hydrocarbons which form the most valuable illuminating constituents of the gas. To lessen the infiltration through the walls of the tube, Mr. Fletcher, of Warrington, now makes tubing consistiug of two layers of rubber separated by a fold of tinfoil.

MANUFACTURE OF ETCHING INK. (*Dingl. Polyt. J.*, 250, 555.)—According to Müller, a liquid for etching on glass has recently been introduced into commerce, and can be used with an ordinary pen. It cousists of hydrofluoric acid, ammonium fluoride, and oxalic acid, and is thickeued with bariuni sulphate. A better ink is obtained as follows:—Equal parts of the double hydrogen ammonium fluoride and dried precipitated barium sulphate are ground together in a porcelain mortar. The mixture is then treated in a platinum, lead, or gutta-percha dish with fuming hydrofluoric acid, until the latter ceases to react. D. B.

PHOTOGRAPHIC CLUB.—At the next meeting, on September 17, the subject for discussion will be "On Mountants." Saturday outing at Hale End; train leaves Liverpool Street at 2.22 and 2.15 p.m.

To Correspondents.

*** We cannot undertake to return rejected communications.

TRANSPARENT.—1. The same developer will answer quite well, and you must modify it according to the exposure given, just as in making a negative. 2. The best varnish for prints on gelatino-bromide paper is a solution of gum dammar in benzole, about forty grains to the ounce being a convenient strength. You must take care to obtain genuine benzole, and not the so-called benzoline or light petroleum; and do not forget that the vapour is extremely inflammable, so you must not work near a flame.

N. M.—We believe that a block six inches square costs about 50s. The address given on the print is sufficient.

AN INDIAN AMATEUR.—1. One part of bichromate of potassium and six of glue will answer well. Soak the glue in cold water for some hours, and melt in a water-bath, after which add the bichromate, this having been previously dissolved in the smallest possible quantity of hot water. 2. It is made by mixing the phosphorescent sulphide of calcium with a spirit varnish, and it can be obtained at 5A, Aldermanbury Postern.

W. W. H.—There are several such processes, and accounts of them will be found in recent volumes of the PHOTOGRAPHIC NEWS. You can gather much information from an article which appeared on page 258 of our volume for 1883.

S. W. WINSER.—1. It would certainly not be fit for use after having been kept so long; but under ordinary circumstances it will keep well for a few weeks. 2. Probably four or five. 3. Add a few drops of tincture of iodine to ten grains of starch boiled in an ounce of water, so as to obtain an intensely blue solution. This will be decolourised when a few drops are added to the water if hypo is present; but several washings should be given after the washings have ceased to give any indication with this test.

J. W.—1. Cover the dabber with the thinnest india-rubber, obtained by blowing out a toy air-ball until it bursts. 2. Oil of lavender (the cheaper kind sold as oil of spike). 3. About 200 deg. Fahrenheit, and for three or four hours. 4. The method of working does not appear to us to be practicable, and, moreover, danger is likely to arise.

T. W. O.—You are right as to the order in the previous case. As an additional lens, we should recommend you to obtain one having an equivalent focus of three inches, and capable of including a sufficiently wide angle to cover the quarter-plate.

G. C.—1. A light blue tint is generally preferred, and, if you object to white, you cannot do better than to adopt this colour. 2. Nothing better than thick and fresh gum.

TAFFY.—Some of them would certainly be amusing; but to put all in full would occupy about two pages of NEWS.

GIL BLAS.—1. You can best obtain it by writing to the maker: Philadelphia, Pa., U. S. A., will he sufficient address. We do not know the cost. 2. The books you mention are decidedly the best works on the subject.

H. G. P.—We should recommend you not to make a trough, but to purchase an old paraffin oil cask. Still, if you resolve to make one, you had better put it together with sides over-sailing at the ends, and the over-sailing ends should be fastened with long screw bolts. The bottom ought to be matched into the side and end pieces, so that the end bolts keep all the parts together. Notice how a slate cistern is ordinarily made.

FORESTER.—1. Quite so; it will only require one-fifth of the exposure.

X. X. X.—In such a case it would be well to fume the paper, and we should recommend you to use a bicarbonate toning bath. Chloride of gold 1 grain, bicarbonate of soda 3 grains, water 8 ounces.

S. W. WINTER.—It is quite incomprehensible to us, and we should like to see the negative.

NOVICE.—1. You do not say whether you use ready sensitized paper or not; if you use it, try another sample, or sensitize your own. 2. Try the bicarbonate toning bath recommended to X. X. X. It would be well for you to obtain Abney and Robinson's comprehensive manual of "Silver Printing."

O. T. C.—There is no satisfactory remedy; but the best plan is to make as perfect a transparency as possible, and then to soak the negative in a dilute solution of potassium cyanide—say about fifteen grains to the ounce. Wash well before drying.

PAPIER MINERAL.—You can obtain it from Werge, of Berners Street, or from the Autotype Company.

F. CARSTON.—1. Considering the result is doubtful, and the number of plates so small, you had better reject them, unless you have spare time on your hands. 2. The main point is to very thoroughly wash away the whole of the bichromate. 3. We can see no reason why there should be any advantage in so doing; but do not let that prevent you from making the experiment.

PRINTER.—Positive prints are made in the usual way, and fixed, but not toned; they are then immersed in a saturated solution of bichloride of mercury, and allowed to remain in the liquid until all traces of the image have disappeared. If now washed and dried, they may be kept without deterioration, and the impression may be revived at any time by immersion in a hypo bath. The developing paper ordinarily sold with the so-called magic photographs is merely thick blotting-paper which has been immersed in a saturated solution of "hypo," and dried; it is moistened and laid on the bleached print.

The Photographic News Registry.

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The Photographic News.

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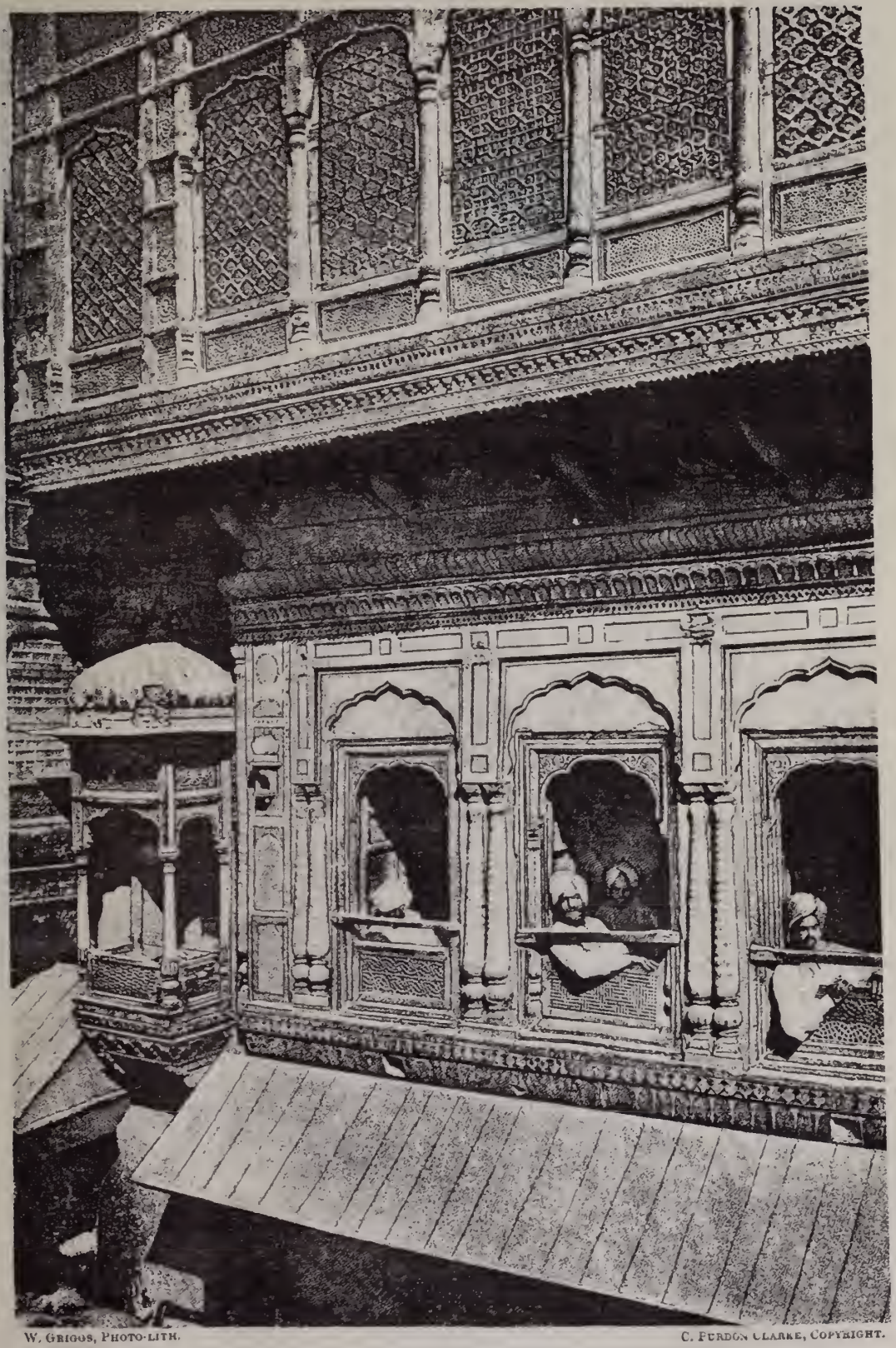

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A MERCHANT'S DWELLING OVER A SHOP, AMRITZAR.

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1359.—*September* 19, 1884.

CONTENTS.

ENLARGED NEGATIVES FOR AMATEURS.

THE increased use of the pocket camera has led to the amateur photographer applying himself greatly to a branch of the photographic art which was, until lately, practised but little, except by the professional. We refer to that of enlarging.

It is pleasant to be able to carry all the requirements for taking half-a-dozen negatives in a parcel so small that if it is, as a matter of fact, somewhat bulky for the pocket, it is at any rate no heavy impediment to the pedestrian, the tricyclist, or even the bicyclist; but to get the full advantage of the small negatives which are produced, it is necessary to enlarge afterwards; and to get the very best results, it is necessary to produce enlarged negatives.

It is true that since the general introduction of gelatino-bromide paper a great power has been put in the hands of the photographic amateur. He can with comparative ease produce single enlargements of any size. Still, if the pocket camera is to take the place of the larger ones which many carry, it becomes necessary to have enlarged negatives from which prints may be taken in the ordinary way, which, in fact, take the precise place of large negatives which might be produced in the field.

Of the many processes used for producing enlarged negatives, probably the one which still holds its own is the wet collodion process. Few amateurs, however—at any rate, of those who have commenced photography within the last few years—are willing to add to their dry plate impedimenta a wet plate kit for the mere purpose of making enlargements, especially as the size required would naturally be considerable. The amateur must get his enlarged negatives by the same process that he produces his small ones, or do without. The question therefore naturally arises, whether gelatine plates will afford enlargements as good as those got by the wet process, and, if so, what is the best course to pursue in securing them.

Our own experience is that enlargements as good as any can be produced by the use of suitable gelatine plates, and that for the sizes that the amateur is likely to use, not larger than 15 by 12, or even 12 by 10, there is no great drawback in the process.

Concerning the plates to be used, we may say that whilst the most rapid ought not to be employed, there is no necessity to get very slow plates. Those of moderate rapidity, especially such as give very clean shadows, will do excellently.

All are aware that, for the production of an enlarged negative, it is usual first to produce a transparency, and from that to get a negative. Two courses may be pursued. A transparency of the size of the original negative may be taken, and from that there may be produced an enlarged negative by the lantern or other optical arrangement; or an enlarged transparency may be produced by an optical arrangement, from which may be got a negative of the same size by contact.

The latter arrangement involves the use of two large plates; the former of only one large plate and one small. There is, therefore, decided economy in the first-mentioned method. There are, however, such decided advantages in the less economical method, that we recommend its adoption.

There is, in the first place, a disadvantage in the cheaper process which is due to the inferior glass which is usually coated with gelatine emulsion. The unevenness of the glass makes perfect contact throughout impossible, and at the juncture where the contact exposure is made, there is certain to be a loss of definition in some parts. If this loss of definition is due to the large plates, it will probably not be noticeable at all; but if it is produced in the small plates, and is subsequently *enlarged*, it will become very noticeable indeed.

Another great advantage in the use of two large plates will be found if it be desired to do any retouching. The retouching of a negative can only be so done as to increase the density of parts. It would often be most desirable to *de*crease the density of a part, and thus avoid performing a separate operation on each print taken from the negative. The equivalent of this may be done on the transparency used for enlarging; but were it done on the small sized transparency, the pencil marks being enlarged afterwards would appear very conspicuous.

The apparatus most suitable for enlarging is that of the nature of the optical lantern, or, as it used to be termed, the magic lantern. Arrangements, both finished and makeshift, have been so often illustrated and described in our columns that we need say little about the matter here. The lens must not be one specially constructed for lantern exhibitions, but must be a photographic lens. One of the "rapid" landscape type is the best. The focal length should be at least one and a-half times that of the plate to be enlarged from.

The quality of negative from which the best enlargement can be got is pretty well known. It should be a soft negative with ample detail, but having a little very quite clear shadow. The sort of negative which will print quickly, and which will just give a bold silver print when the printing frame is exposed in a dull light, is the kind required.

The transparency got from this, especially if it be enlarged, must be somewhat dense. The density may be such that a very brilliant print—which would be a negative, of course—would result from it. The exposure must be so long that no part of the glass of the transparency is left quite clear. If this be not attended to, the detail in the shadows of the final enlarged negative will be lost, or

at least so weakened as to give an impression of under-exposure.

It is quite possible to get a good enlarged negative from a small one so much over-exposed that it will give but a miserably weak direct print, and this especially if development has been stopped before the shadows are much veiled.

The exposure is always a great difficulty in enlarging—it varies so enormously with the density of the negative and the amount of enlargement required. It is well, where very large negatives are being produced, to make a trial exposure on a small plate of the same sensitiveness as the large one. The length of exposure required for the contact printing can be judged with very fair accuracy after a little practice.

The developer used need not in anything materially differ from that used to produce a negative. Either the alkaline or the iron developer may be used.

Those who have a large camera, one of the size up to which they wish to enlarge, will find the most convenient method of getting an enlarged transparency to be that in which daylight is used. A hole is made in a shutter to hold the small negative; a reflector is fixed behind this at an angle of 45°, and the large camera is simply placed opposite the negative, the lens from the *small* camera being uesd, and the dark slide being manipulated in the ordinary way. It is by no means necessary absolutely to darken the room. All that is necessary is to ensure that no very bright light streams in nearly in front of the lens.

A NEW LENS.

THE specification has recently been issued by the German Imperial Printing Office of a patent granted in March of last year, to Herr Moritz Mittenzwey, of Zwickau, for a new form of lens intended for the production of photogaphs.

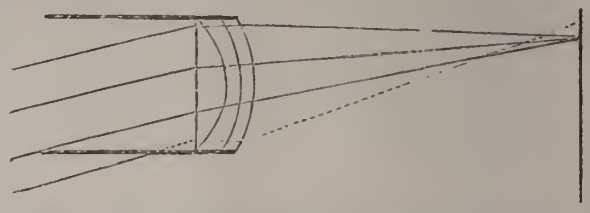
The striking novelty in this lens is, that although of the single form, it is constructed to work with an aperture of nearly $\frac{f}{3\frac{1}{2}}$, (larger, that is, than that which is generally given to lenses of the rapid portrait type). Single lenses have hitherto possessed so much spherical aberration that they have not commonly been used with a much larger aperture than one of about one-twentieth ot the focal length. Efforts have not been wanting to obtain a larger aperture with fair definition in single lenses, but, so far, it has not been attempted or thought practicable to make the aperture *much* larger than that mentioned. The late Mr. T. Grubb, more than twenty years ago, introduced a single lens in which he succeeded in so far reducing spherical aberratiou as to obtain fair definition with an aperture of about one-fourteenth of the focal length. This step, which was considered a great one at the time, will, it is evident, bear no comparison with what Herr Mittenzwey proposes to do.

The standard of rapidity adopted by the Photographic Society of Great Britain is a lens the aperture of which is one-fourth of its focal length, or $\frac{f}{4}$, aud is about the same as that of an ordinary rapid portrait lens. If the aperture of the various lenses that have been referred to be set down in a tabular form, aud compared with this standard of rapidity, it will be easy to recognize what an important claim is made for the new lens.

	Aperture.	No. on the Universal or Standard System.
Single, or landscape lens	$\frac{f}{25}$	25
Grubb's aplauatic lens (so-called)	$\frac{f}{14}$	12
Portrait lens	$\frac{f}{4}$	1
Mittenzwey's new lens	$\frac{f}{3\frac{1}{2}}$	$\frac{3}{4}$ nearly.

The numbers in the last column represent the comparative exposures. It follows that, although a single lens, the latest introduction will work with a rapidity requiring an exposure of about two-thirds that of the portrait lens, or be equal to those which are known as extra rapid. It is a generally accepted rule that the fewer parts and the less complexity (without sacrificing the perfection of the result) there is in construction, the better. In the case of lenses, every additional surface to be ground involves not only expeuse, but the liability to error from imperfection of workmanship; and if Herr Mittenzwey has really succeeded in doing with a single objective, what Petzval could only accomplish with a doublet, of which even then the components of one of the lenses had to be separated, he has indeed achieved a great thing.

In the specification three variations are described, of one of which we give a drawing. In all three the lens consists



of three cemented components; the back and fronts are of the same glass; the front lens is convergent, and the back divergent. In the figure the frout and back lens are of crown, and the middle one of flint; but in one of the variations this is reversed, and the middle lens is a strongly convergent crown, whilst the front is a very slightly convergent meniscus, and the back is powerfully divergent, both of flint.

In the leus illustrated the curves are given as follows:—

First surface	plane
Radius of the second aud third surfaces ...	36·66 mm.
,, fourth and fifth surfaces ...	64·00 mm.
,, sixth surface	73·00 mm.

This is for a lens of 168 mm. focal length, and 50 mm. diameter.

The indices of the glass are—

	Crown.	Flint.
Index of refraction for optical rays ...	1·52000	1·62500
,, ,, chemical rays ...	1·53400	1·65300

It will be noticed that the lens is set back in a tube, and the effect of this is—for all rays excepting those which form the centre of the picture—to act to a certain exteut as a diaphragm. The lens will not, therefore, when used with its full aperture, work at its calculated speed auywhere but in the centre of the field. It must be remembered, however, that this is also necessarily characteristic of the present ordinary portrait lens, the components of which are separated by being mounted at the two ends of a tube. The object in the present iustauce of using the tube which acts as diaphragm is to cut off those rays the spherical aberration of which it has not been found possible to remedy. The dotted line shows the aberration that would exist with oblique rays if there were uo tube or stop.

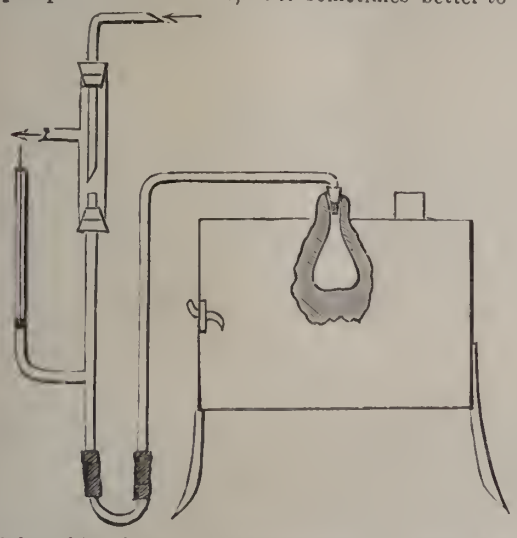
The lens figured is, as a whole, plano-convex. One of the other forms described is a rather flat meniscus, and the other, which is called a group lens, a tolerably deep one. This latter instrument is constructed to work with an opening of $\frac{f}{6}$, or about at the same speed as the most rapid of leuses of the Steinheil rapid symmetrical type.

We have not yet had an opportunity of examining aud testing the lens itself to ascertaiu how far the inventor has succeeded iu solving the problem which he set himself, and for the present must content ourselves with laying before our readers a description of the characteristics of the lens, as set forth by Herr Mittenzwey, the patentee.

A SIMPLE THERMO-REGULATOR.

To maintain a coustant temperature is a problem that has often to be solved in manufacturing technical operations, and an automatic arrangement for this purpose is almost a necessity in drying-cupboard or drying-rooms when

much work is to be done. The arrangement here illustrated, which, though not new in principle, at least has the merit of requiring only ordinary laboratory fittings, is due to Mr. H. B. Wilson. The empty flask, which is placed inside the drying-cupboard or room, must vary in size according as a higher or lower temperature is to be maintained, and it may have a capacity of a few ounces or several gallons. It is connected, air-tight, with a U-tube, the larger portion of which is filled with mercury. Instead of using a continuous glass tube bent at the proper place in the flame, it is sometimes better to use



straight tubing for the longer pieces, and to attach a short U-piece with stout rubber joints.

When the air inside of the flask becomes expanded, it depresses the mercury in the inner, and raises it in the outer limb, until it more or less completely cuts off the supply of gas, which passes in the direction of the arrows.

The outer tube bears a lateral branch, into which a piston, made of a knitting-needle and a disc of leather, fits. By pushing this down a certain distance, or by raising it up, so as to draw some of the mercury over into the branch, the temperature at which the mercury would otherwise cut off the gas may be varied at any time.

The arrangement shown is very easy to adjust to the required temperature, and is only subject to variation by the fluctuations of barometric pressure; but this may be disregarded in most instances.

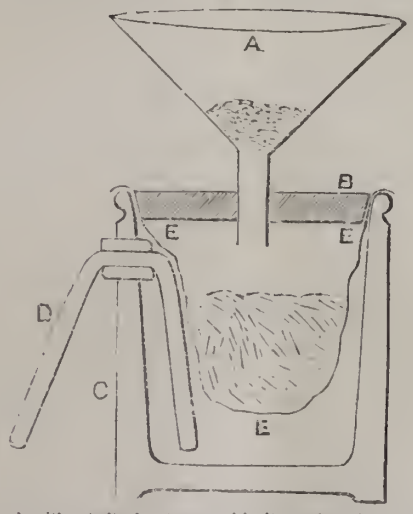
Practical Papers for Beginners.

No. 9.—MAKING GELATINO-BROMIDE PLATES.

AT the present day the commercial manufacture of dry plates is brought to such a degree of perfection as regards quality, that there is but little inducement for the photographer, whether amateur or professional, to make his own emulsion and coat his own glasses; but it is very desirable that every photographer should be able to prepare plates if he have occasion so to do. We therefore now propose to give directions which will enable any careful person to make an emulsion of the highest degree of sensitiveness, and we may confidently state that success is certain if the directions are carefully followed. The method about to be described is that of Dr. Eder.

Pure and dry bromide of potassium is taken, and 24 grammes (370 grains) are dissolved in 300 cubic centimetres (10½ fluid ounces) of distilled water,* a perfectly clean glass bottle being used. In the solution of bromide thus obtained, 40 grammes (617 grains) of a suitable gelatine are soaked—the gelatine manufactured by Simeon, of Winterthur, answers very well—and as soon as the gelatine has thoroughly swelled, the bottle is placed in water maintained at a temperature of 35° to 45° Centigrade,* and the contents are agitated until the solution of the gelatine is complete.

A solution of ammonia-nitrate of silver is now prepared by dissolving 30 grammes (463 grains) of silver nitrate in 300 cubic centimetres (10½ ounces) of distilled water, a clean glass beaker being used, and strong pure ammonia solution is added drop by drop, with constant stirring with a glass rod, until the precipitate which is first formed disappears, and the solution becomes clear. Up to this point the work may be done in daylight; but the next operation, which consists of the gradual addition of the ammonia nitrate solution to the gelatine and bromide solution, must be performed in as feeble a dark-room light as practicable. Care must be taken that the temperature of the gelatine and bromide solution is not above 35° Centigrade when the silver solution is added, and after each addition the bottle must be thoroughly agitated. The bottle containing the emulsion is now replaced in the hot-water bath, care being taken that the temperature of the water contained in the bath is not above 32° Centigrade, and it should be maintained at this temperature—let us suppose by the occasional addition of boiling water—for three-quarters of an hour. The whole is allowed to slowly cool down until a temperature of about 25° Centigrade is reached, when the emulsion is poured out into a perfectly clean glass dish, and allowed to set. The set emulsion is now divided into threads by being squeezed through canvas (such as is used for Berlin wool work) having a mesh of not less than an



A, Funnel, with a tuft of cotton wool in its neck, this wool serving to filter the inflowing water; B, Bung made of gutta-percha; C, The jam-pot, provided with a hole to carry a cork, which holds—D, India-rubber tube; E, Muslin bag, held in postion by the bung, and containing the fragments of emulsion.

eighth of an inch, so that the jelly is cut up into strips like vermicelli. But before this canvas is used it should be thoroughly cleansed by being first boiled in a dilute solution of washing soda—say one ounce to the pint—and then by several boilings in plain water. In squeezing the emulsion through the canvas, care should be taken that the hands are thoroughly clean, this being ensured by several washings in clean warm water, after the use of

* For information as to the purification of water by distillation see page 530. In London and most large towns distilled water of a satisfactory purity can be purchased in carboys.

* For use in emulsion making, a thermometer either completely enclosed in an outer tube of glass, or with the graduations marked on the stem, should be obtained. As some of the cheap thermometers occasionally give readings which are erroneous to the extent of nearly ten degrees, a second-class instrument of guaranteed accuracy should be obtained from a reputable firm. It is needless to go to the expense of a thermometer of the most accurate and expensive kind.

soap. It is well, more especially in warm weather, to perform the operation of squeezing the emulsion through the canvas under cold water.

The shreds of emulsion are now soaked in several changes of water in order to remove soluble matters; or preferably they are washed in a stream of running water for a period of from two to four hours.

A very excellent apparatus is that already described in the PHOTOGRAPHIC NEWS by Mr. Birrell, the arrangement in question being represented by the cut on preceding page.

This apparatus is placed under a tap, the water being allowed to flow in at about the same rate as it will flow through the filtering medium in the funnel, A. Instead, however, of using cotton-wool for the purpose of filtering the inflow water, it is more convenient to tie a piece of muslin over the stem of the funnel as shown in the subjoined diagram, this method of arranging a filter having

been recommended by Colonel Dawson in a another case. All string and muslin used should be cleansed before use by boiling in soda, and subsequent washing, as recommended in respect to the canvas: and it is undesirable to use either of such materials a second time when one is making a highly sensitive emulsion. The washing being completed, the muslin strainer is removed from the jar, and the edges being gathered together, the whole is swung round a few times to drive off the loosely held water; but notwithstanding this, it is extremely probable that the fine shreds of emulsion will have absorbed so much water as to make the preparation inconveniently weak when melted, and the test of this is to weigh the product. A clean beaker of suitable size is balanced on the scale-pan, and a piece of wet muslin corresponding to that used for retaining the emulsion is placed in the weight-pan. The square of muslin containing the emulsion should now be tied up blue-bag fashion, placed in the beaker, and weighed. If it weighs more than 750 grammes (26½ ounces), it is well to remove some of the water—a very easy matter if the bag be dipped in alcohol*—and moved about for a few minutes, after which it is once more swung round to drive off the redundant water, and again weighed.

The washed emulsion is now put into a clean beaker and melted by the heat of warm water, and the following solution is stirred in:—Alcohol, 28 grammes (1 ounce); carbolic acid, 1 gramme (15 grains).

The emulsion is now ready to be strained or filtered, and one of the best arrangements to use for the purpose consists of a small French porcelain coffee pot, fitted with a perforated strainer, a thickness of fine cambric (cleaned as described above) being tied securely over the bottom of the strainer. Instead of this contrivance, a short-necked funnel, tied over the end with a bag of muslin (see preceding figure) may be used in conjunction with an ordinary teapot; but in any case the teapot should be of true porcelain vitrified throughout; ordinary earthenware, consisting of a porous body covered by a glaze, being quite unsuitable. The special advantage of the teapot, provided with a strainer as described, is that all excess of emulsion

which may be poured on a plate in coating, can be at once drained off into the strainer.

The glass plates used for emulsion work should be of good quality, and they can now be bought all ready polished or cleaned at a very small advance on the cost of the rough glass; still it is wise to give a final polish in order to ensure that the plates are clean.

A plate-vice, such as that represented below, is useful;

and in order to gain the greatest advantage from its use, one of the wooden strips should be fastened down to the work-bench by a couple of screws; also care should be taken to so pack up the plate-holding rebates that the upper surface of the glass is well over the level of the wooden strips. A plate having been set in the vice with the best side upwards (generally marked by a diamond scratch in one corner), a few drops of the following mixture are poured on it:—

Alcohol	4 ounces
Water	3 ,,
Ammonia (liquid)...	1 ounce
Jeweller's rouge	½ ounce

The mixture is now quickly rubbed over the face of the glass by means of a tuft of cotton-wool or a scrap of muslin, after which the excess of rouge is polished off with a clean cloth—an old silk handkerchief answers admirably. The usual method of testing the cleanliness of a plate is to hold it obliquely against some source of light, as a window, and to gently breathe on it. If the moisture of the breath settles evenly on the glass, no streaks or patches being visible, the plate may be considered clean. As the plates are cleaned, they should be carefully piled with their best faces all in one direction; and if the weather is very cold, it is as well that they should be the least bit warm: in fact, just about as warm as they would become by being allowed to remain for an hour or so in a warm sitting-room.

A levelling-stand of a size suited for supporting the plates is now placed on the work-table immediately before

the dark-room light, and a plate, of which the sides appear to be parallel, is carefully adjusted to a horizontal position.

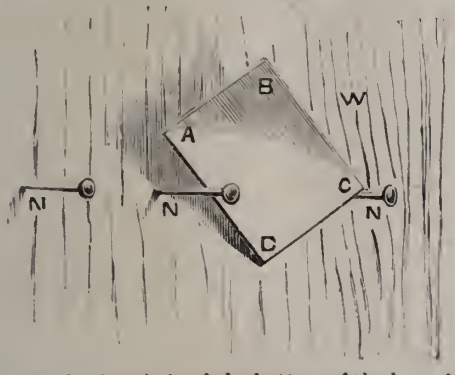
A second requisite is a flat slab upon which the plates can be laid down to set, and for this purpose nothing is better than a thick slab of plate glass set truly level on a firm table.

The final and more important requisite for plate making

* The so-called methylated alcohol may be used if pure and of good quality. It consists of alcohol mixed ten per cent. of wood spirit, and is allowed by the Excise to come into trade duty free, as this addition is supposed to make it so unpalateable as to ensure its not being used in compounding drinks. Still, as it is the custom to use the most impure spirit for methylating, and the practice is to send out the commercial methylated spirit in tins which may or may not be clean, it is necessary to obtain the article from reliable sources, and in clear glass bottles. If it shows the least tint, it ought to be rejected or purified by re-distillation. The material sold in the oil shops as methylated "finish" consists of methylated spirit in which a certain proportion of resinous matter is dissolved, and is quite unfit for photographic uses—unless, indeed, for making varnish.

is the drying cupboard or box : but if the beginner merely wishes to coat some plates occasionally, he can dry his plates very well in a large box containing a dish of chloride of calcium.

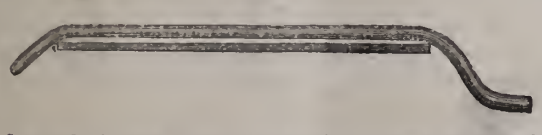
A large wooden trunk is procured, and this is made perfectly light-tight by means which may be left to the ingenuity of the worker to devise ; and, moreover, the lid should shut down as closely as practicable, so as to prevent the circulation of air at the joint. Copper nails are now driven into the insides of the trunk at regular intervals, so that the plates may be supported as shown in the subjoined diagram ; also provide a sheet-iron tray large enough



to cover nearly the whole of the bottom of the box, this tray being intended to contain chloride of calcium, one of the most useful absorbents of water known to the chemist. Before giving details as to the manipulations incidental to coating the plates, we will describe the management of the chloride of calcium and the drying-box. The trunk itself, when out of use, should be kept in a warm and dry place—if possible, in the kitchen, as if the wood be at all damp, the operation of drying the plates will naturally be slower than otherwise ; but when it is used, it is scarcely necessary to say that the dark-room is the place for it. Although chloride of calcium may be bought in bulk at something like £2 or £3 a ton, one has to pay at the rate of about a shilling a pound for quantities of 7lbs. in London. The chloride is broken into lumps about the size of a walnut, turned into any iron saucepan, and heated over a clear fire or a large gas burner until it ceases to give off vapours ; after which it is again broken up into lumps of about the original size (if necessary), and the lumps are turned into the iron tray. About a pound of the chloride to each square foot of tray-surface is a convenient quantity to use.

When the plates are dry, the chloride is returned to the stock jar, and again dried when required for use ; while the iron tray should be well rinsed from every trace of chloride before being put away, or the adhering salt will deliquesce and make the tray continually damp.

Having the emulsion ready to hand in the teapot on one side, a pile of plates on the other side, and the levelling stand before one, all is ready for coating. A plate is set on the levelling stand, and sufficient emulsion is poured on it to form a pool about equal in diameter to two-thirds of the width of the plate, and this emulsion is spread evenly over the surface of the glass by means of a clean glass rod, any excess being drained back into the teapot through the filter. The plate is now laid on the slab and allowed to remain here until the film has set, after which it is transferred to the chloride of calcium box.



Instead of using a plain glass rod to spread the emulsion upon the glass plates, it is a very excellent plan to use the bent guage-rod suggested by Colonel Dawson, and figured below. No special explanation is necessary, and the rod may easily be bent when heated in an ordinary gas flame.

Now a few words as to certain sources of failure which may trouble the maker of plates by the above-described method.

Frilling or Blistering.—Should this occur, it is best to make use of a substratum, the best being made as follows :—

Soluble silicate of soda	...	...	1 part
White of egg	...	...	5 parts
Water	...	...	60 ,,

Agitate well together by shaking up in a bottle containing some broken glass, and filter. The clean surface of the plates is flooded with the preparation, after which they are allowed to dry in a vertical position ; and when dry, they are rinsed with water, and once more dried. When a tendency to frilling shows itself, it is often sufficient to put the developed plate, but yet unfixed, in a saturated solution of alum, and leave it here for a quarter of an hour.

A Greenish Fog on the Negative.—This often arises from the application of too high a degree of heat during the preparation of the emulsion ; but more frequently from want of attention to that extreme cleanliness which is essential in the preparation of an ammoniacal emulsion. Vessels of porous earthenware should never be used, glass being most suitable ; and all vessels should be most rigorously cleaned after use. The use of impure ammonia will occasionally cause green fog.

General or Ordinary Fog may be due to the use of an unsafe light during the preparation of the plates, or from an unnecessarily long exposure to the light of the dark room.

Faults arising from imperfect straining of the emulsion, from uneven coating, or from pimples or rough places on the plate, are generally easy to trace to their source.

Transparent or Insensitive Markings, generally round, and graduating off towards the edges, may arise from some of the dust of the dry chloride of calcium coming in contact with the sensitive surface. If, however, the dish containing the chloride is placed in position before the plates are put into the drying-box, and care is taken not to shift the box during the time of drying, there will be no risk of plates being spoiled by particles from the chloride.

PHOTOGRAPHIC FESTIVAL AND EXHIBITION AT FRANKFURT-ON-MAIN.

On Wednesday, the 10th inst., the Frankfurt Society for the Advancement of Photography opened the exhibition and festive gathering which is to commemorate their first decennial anniversary. The gathering took place in the spacious apartments attached to the Palm Gardens, the first solemnity of the day being a well-served breakfast *à la carte*. At one o'clock the formal opening of the Exhibition took place, and after a somewhat rapid survey of the excellent collection of pictures, the greater part of those present took a walk through the leafy groves and the various conservatories of the Palm Gardens ; this walk through the favourite resort of the Frankfurters being a part of the pre-arranged programme. In the gardens Herr Maas took a photograph of those present, and at four o'clock a special concert took place in the Chapel. The festival supper in the great saloon was, however, the most striking feature of the occasion.

Early on Thursday morning the photographers gathered together, and at 11 o'clock they went to view the grand panorama representing the Battle of Sedan. A dinner, a visit to the Zoological Gardens, and an evening at the Opera, formed the remaining items in the programme for Thursday. For Friday a trip to Rüdesheim was arranged. Altogether about 150 persons were present.

The Committee who have the credit of arranging the programme consisted of Herrn Ayx, Borntrager, Geld-

macher, Haake, Hartman, Hetzer, Luer, Maas, and Reutlinger.

Amidst all the festivities, technical and scientific matters were not neglected, Dr. Eder having read an important paper on the preparation of isochromatic plates; and he showed a number of examples illustrating their application to the photographing of paintings.

The collection of apparatus shown was extremely interesting and instructive.

Dr. Eder's paper, which will be published in detail in the PHOTOGRAPHIC NEWS, brought out a discussion on "sensitizers in the developer for emulsion plates;" and Herr Haake, of Frankfurt, remarked that he had known good results to follow the use of the following bath after exposure and before development:—

Hyposulphite of soda	1 part
Water	1000 parts
Citric acid	3 ,,

The solution is allowed to stand at rest for some days, and then it is filtered. An immersion of one second proved sufficient in ordinary cases, and the iron developer was used. It was estimated that the sensitiveness was three times more than in the case of plates that had not been treated. Dr. Schleussner spoke of the value of an additon of hyposulphite to the oxalate developer, and Dr. Eder said that Scolik, of Vienna, had treated some under-exposed plates very successfully by dipping them in extremely dilute hypo solution (without citric acid) previously to development. Reference was also made to a secret preparation sold for adding to the developer; still this proved to contain no hyposulphite, but formic acid and other substances.

The question was then raised as to why plates which have been kept a long time, show signs of fogging round the edges; and Herr Geldmacher said that the quality of the gelatine used had no bearing on the point. It was the opinion of Herr Müller, of Munich, that mischief arose mainly from the action of damp; in fact, he found it advantageous to keep the boxes and packing materials in a warm room until required for use; but Herr Kiudermann attributed the mischief to the presence of hyposulphite in the paper and card.

It was then announced that the prizes in the competition of various makes of dry plates had been awarded as follows:—

1st Prize (silver medal)—Dr. Schleussner (22° W.)
2nd Prize—Matter, of Mannheim (19° W.)
3rd Prize—Dr. Stiefel (20° W.)
4th Prize—Engel and Feilknecht (17° W.)

The Jury for adjudicating on the photographs and apparatus consisted of Professor Samhaber, Herr Eilander, Herr Pollot, Herr Maas, and Dr. Eder; and the awards were as follows:—

Silver Medals.—1st Prize to Dr. Albert, of Munich, for his platinotype prints, and for reproduction of paintings on isochromatic plates. 2nd Prize to Van Bosch, of Frankfurt, for portraits. 3rd Prize to Braun, of Berlin, for novelties and improvements in photographic apparatus. 4th Prize, Jungmann, of Baden-Baden, for portraits. 5th Prize, Lindt, of Melhourne, for landscapes. 6th Prize, Müller, of Munich, for portraits. 7th Prize, Reutlinger, of Paris, for portraits. 8th Prize, Ruf, of Mannheim, for portraits. 9th Prize, Augerer and Szekely, of Vienna (disqualified by late arrival). 10th Prize, David and Scolik, of Vienna. 11th Prize, Lugardon, of Geneva.

Bronze Medals.—Fraulein Cullic, of Frankfurt, for portraits; Deigelmeyer and Fuhrmann, of Munich, for collotypes; Dreesen, of Flensburg, for instantaneous subjects; Haake and Albers, for collection of photographic requisites; Roch, of Neuwied, for enlargements and carbon prints; Naumann and Schröder, of Leipzig, for collotypes; Schmidt, of Frankfurt, for portraits; Strater, of Crefeld, for large portraits.

Certificates.—Engel, of Twann; Fraulein Flinkelmeyer, of Frankfurt, for retouching; Geldmacher, of Frankfurt; Grainer, of Reichenhall; Reimer, of Wilhelmshafen; Eichiegler, of Frankfurt, and Eckhorst, of Paris.

Among the exhibits there were many life-size pictures, taken direct on galatino-bromide, and a good show of instantaneous subjects; and the importance of isochromatic plates for picture reproduction was fully illustrated.

An historical collection, exemplifying the progress of photography from the time of Daguerre, was examined with lively interest.

HOW TO PHOTOGRAPH MICROSCOPIC OBJECTS.

BY I. H. JENNINGS.

LESSON V.—DEVELOPMENT.

THE development of a photo-micrograph does not differ much from that of other negatives, but requires somewhat more patience, as the image on a properly exposed plate is usually very slow in appearing, and must not be "forced" in any way. Any ordinary dry-plate developer may be used, but the writer has found that known as the sulphite developer answer best.

Ferrous oxalate is recommended by some photo-micrographers, notably by Dr. Sternberg, but is hardly sufficiently "elastic" to satisfy all requirements. It has the great merit of being clean and simple, while it never stains the negatives, as some preparations of pyrogallic acid do; but the operator will find that with this developer he has very little control over the development. In fact, the development is so mechanical, that some operators, like Dr. Sternberg, are content to place the plate in the solution and let it take its chance. No one who has become used to pyrogallic acid will ever care to use ferrous oxalate, and the writer would not advise the beginner to use it, but at once to master the difficulties of pyrogallic acid and ammonia.

However, as some may prefer to try what can be done with ferrous oxalate, the formula for this developer is given here:—

Saturated solution of ferrous sulphate ...	1 part
Saturated solution of potassic oxalate ...	3 parts

The potassic oxalate should be neutral, but as it frequently is alkaline, a few crystals of oxalic acid may be added, until the solution is neutral to test paper. The ferrous sulphate should be added to the potassic oxalate, not *vice versa*. A solution of potassic bromide, 20 grains per ounce, should be kept at hand. A few drops of this will be useful to add to the developer in case of over-exposure.

The developer which the writer prefers, and which he has used successfully for all sorts of work for some years, is the following:—

A.—Pyrogallic acid	¼ ounce
Sodic sulphite	1 ,,
Water	40 ounces
Citric acid	1 dr.
B.—Liquor ammoniæ	½ ounce
Potassic bromide	40 grains
Water	40 ounces

These form stock solutions, and will keep indefinitely. Both had better be kept in stoppered bottles. The sodic sulphite must be good; otherwise, good results need not be expected. Some writers have stated that sodic sulphite produces green fog, but this is hardly correct. The writer had used the sulphite developer for over two years before he saw anything of green fog. He had been accustomed to buy his chemicals from a good chemist, and had always paid 1s. 6d. per pound for sodic sulphite. Happening once to require some immediately, he purchased a sample from the nearest shop, and paid 6d. per pound for it. It was wretched looking stuff, but he made it up. On developing, every plate was covered with a glorious sheen of green fog. Happily, this was completely got rid of by applying Mr. H. Farmer's solution, which will be described further on. *Moral:* Buy the best chemicals from a good chemist, and do not grudge the price paid for them.

Another modification of the pyrogallic developer is given by Mr. S. Fry, as follows :—

A.—Acid pyro	1 ounce
Saturated acid solution of sodic sulphite	12 ounces
B.—Ammonium bromide	300 grains
Ammonia liquor	2 ounces
Water	12 ounces

Take 1 ounce of A; put it in a 20-ounce bottle, pouring on it 15 ounces of water. Do the same with B. Use equal parts for developing.

To develop a plate, proceed as follows :—Have a good-sized lamp glazed with pale red glass, not with the black abomination generally called "ruby," which is almost opaque to light. A good lamp may be made from any kind of box, by fitting to it a sliding pane of red glass in place of the lid, and putting a small paraffin lamp therein. A chimney should be made at the top, to ventilate the box. This arrangement will give a flood of light without endangering the plate. The writer always develops close up to the lamp, and has never yet fogged a plate. If the operator cannot see what he is doing, he need not expect good negatives, but may reasonably look for indications of failing eyesight after a few months' work. So, to get good negatives, and save temper and eyesight, have plenty of light of the right sort. No light is really non-actinic, and much of the "ruby" glass in use is quite as unsafe to use as the yellow glass used in developing wet collodion plates. Yet, once in the developer, even yellow glass may be used with complete safety. It is only while the plate is dry that exposure to a strong light is likely to act injuriously. Thus, in changing plates, or in taking them from the slides to develop, let the lamp be shaded or turned down; but while developing, every detail must be clearly seen.

PARASITE OF OX. 2-inch obj.

To proceed. Place the developing dish near the lamp; pour into the developing cup, for a half-plate, 1 ounce of the pyrogallic solution, and ½-ounce of the ammonia and bromide. Place the plate in the dish, and pour over it the mixed solutions. If the image runs out rapidly, pour the developer off, and make up a fresh developer of 1 ounce pyro and 1 drachm ammonia and bromide. If, after this, the detail does not come out satisfactorily, pour the developer back in the cup, and add more ammonia. By varying this mode, plates that have received thirty times the correct exposure may be satisfactorily developed. They will hardly have the brilliance and "pluck" of a properly-exposed negative, but will yield fair prints.

If the image does not make its appearance after it has been in the developer about a minute, add the remaining ½ ounce of the ammonia solution. The image will then slowly appear, if the plate has been properly exposed; but if under-exposed, only further doses of ammonia will bring it out. In the latter case, take no further trouble with the plate, but at once expose another, for an under-exposed plate is simply useless.

It will be found in developing some negatives that one part will develop more readily than another, and become so dense as to be quite unprintable. The photograph given below (parasite of ox) is an example of this. On developing, the body appeared first, and became of an alarming blackness before the legs had got little more than their outline. The developer was at once thrown off, and the negative well rinsed in water. Fresh developer was made up, and the tray tilted up, so that when the negative was again placed in the dish the developer would cover the parts only partially developed, which in this case were the head and legs. The dish was gently rocked all the time, and the negative, when finished, was of uniform density. By this means the after reduction of the negative was avoided.

If the development proceed satisfactorily, don't be in any hurry to take the plate from the developer; over-development will not do much harm, while the contrary would ruin it. When all the details are well out, examine the plate, by holding it up before the lamp. Should it prove sufficiently dense, rinse it in water, and place it for a minute in a solution of alum and citric acid; wash again, and put it in another dish containing hyposulphite of soda made up thus :—

Hyposulphite	4 ounces
Water	20 ,,

When the creamy bromide of silver is dissolved, which may be known by the plate becoming quite clear and transparent, place the negative in fresh hyposulphite for a few minutes; no fear need be entertained of the hyposulphite solution *weakening* the negative. Then put the plate in running water for half-an-hour. This will be sufficient, but any trace of hypo will be got rid of in the next bath :—

Alum	2 ounces
Citric acid...	1 ounce
Water	20 ounces

This solution will also harden the film, and render it less liable to injury from scratches or wet. The final immersion in alum should be regarded as absolutely necessary. It will brighten up the negative, removing any stains which the developer may have left, and make it "quicker printing."

The negative should not be dried too rapidly. In fine dry weather it can be best dried by placing it out of doors. In winter time, the writer stands his negatives on a warm mantel-piece, where they dry in one or two hours. The only precaution to observe is, that the plate should have previously been soaked in the alum bath for at least five minutes; otherwise, if the film be composed of soft gelatine, the heat of the mantel-piece is apt to melt it.

Notes.

Apart from value as a striking example of group-posing by Rejlander, our supplement of this week possesses a melancholy interest; for no less than five out of the nineteen who were photographed in 1869 are now no more. The photograph was taken in Rejlander's studio in Victoria

Street, and although the photographer himself figures in the group, he arranged everything, an assistant having made the exposure.

Those new to the study of photography are likely to gain much by a careful perusal of the series of "Practical Papers for Beginners" (commenced in our issue of July 18th), as many matters hardly touched on in the comprehensive handbooks are minutely dealt with. One method of performing each operation is described, and that method the one which we believe best for the beginner.

Not only had the fire which broke out at the Stores in Chandos Street been extinguished within an hour of its commencement, but by the expiration of that time the floor had been re-covered with kamptulicon, and workmen were busily engaged in repairing the damage done to the roof. On the principle of giving honour where honour is due, it ought to be known, we think, that but for photography this marked expedition could not have been displayed, for before anything could be moved or repaired, a photograph of the *locus in quo* had to be taken for the use of the Fire Insurance Companies concerned. Once again, then, do we find what positive assistance a negative can render.

An epoch in the application of photography to journalism may be marked by our illustration on page 562. Not only is the engraved block made entirely by photographic agency, but it represents current news; and what is of perhaps more importance, it was printed satisfactorily along with the rapidly-machined letterpress of the PHOTOGRAPHIC NEWS.

"How quickly can such a block be produced?" is an important question. We think it reasonable to hope for, and look forward to, the time when such auto-engraved blocks may be produced with certainty in five or six hours after the exposure of the sensitive plate in the camera; doubtless our daily papers will then be regularly illustrated by photography.

Persons who live by their wits should have good memories. Some time ago a tall, gaunt, shabby, slightly-rubicund-nosed individual called upon a well-known photographer, and told a long tale, how he was a colourer of photographs, and how, through a long illness, he had lost his connection. It wasn't money he wanted so much as work, although he threw out a hint that he hadn't tasted food that day. The photographer, willing to lend a helping hand, gave him sixpence and a carte to colour, telling him that if he did the work well, he could have constant employment. The man was overwhelmed with gratitude, and promised to bring the carte back the next day. A month went by before the "colourist" made his appearance, and when he did, it was to go on the same yarn about his destitution and inability to get work. "But," said the photographer, "where is the photograph I gave you to colour a month ago?" "Did you give me one to colour, sir?" "Of course I did." "Oh, I beg your pardon, I'm sure. *I quite forgot I've been here before, or I wouldn't have called!*" And he walked out quite undisturbed.

The latest novelty in photographic albums—if album it can be called—is a series of plush-covered frames, fixed on one side to a common centre, and opening like the leaves of a book. This is made to hang on a wall, and forms a very effective and novel drawing-room ornament.

Photography supplies one of the best tests of popularity. The sale of Mr. Gladstone's photographs in Scotland during his recent campaign has been enormous. It is said that in Edinburgh the street hawkers have sold over £300 worth of penny photographs.

Whether it is that infirm artists are employed we cannot say, but the attempt to paint up to a photograph generally results in a failure. A picture issued by a French house has just made its appearance in the print shops. It represents two children lying in each other's arms in a basket. The children have been beautifully photographed, and are charmingly posed; but the basket has been put in by the brush, and while the figures are round, solid, and full of light and shade, the basket is as flat—to use a homely simile—as a pancake. A more incongruous effect we have not seen for some time. Why the children could not have been photographed in the basket is puzzling.

Thursday next is the last day to send in pictures for the London Exhibition; if packed, to be sent to Mr. James Bourlet, 17, Nassau Street, Middlesex Hospital; but if unpacked, they may be delivered at the Gallery, 5A Pall Mall East. In any case, a letter containing a brief description must accompany them.

A "Special Notice," stated to be "*by order of the Council*," is printed in blue ink prominently across the official circular. It runs thus:—"*The rules and regulations respecting the Exhibition are to be strictly adhered to, therefore no picture will be received after nine o'clock on Thursday, September 25th.*

To thus make it appear that the rules are only to be observed in an exceptional case is injudicious, apart from the ludicrousness of a ruling body making an order to the effect that its own rules shall be observed. The "Special Notice" at once raise a doubt in the mind.

A case in which plaintiff and defendant were both photographic artists lately came before the Supreme Court at Baltimore, Mass. The object of the suit was to settle a dispute as to the profits of a photographic business that had been sold, and the prosecuting counsel caused considerable amusement by applying, with all apparent seriousness, that the case should be heard *in camerâ*.

Some twenty portraits of the leading men of the British

Association are given in those numbers of the *Montreal Star* which were issued during the session; but we do not find that the photographer is accredited with any of the honour involved in their production. The making of engraved portraits from photographs by illustrated newspapers is a recognised thing; but the photographer should have his due. On the whole, the series of portraits issued by the *Montreal Star* is good, one of the worst being that of the President of the Photographic Society of Great Britain.

A lady correspondent cannot make out why there should be such seeming difficulty in photographers keeping their dry plates separate. "Surely," she writes, "if they have not a plate-rack, they have a kitchen dresser!"

The *San Francisco Examiner* quotes a pretty tall photographic story from the *Independant*. The *Independant* says there has been purchased from an Indian a pair of field glasses, supposed to have belonged to Hahn, a lost guide of Wheeler's Expedition. The instrument was found in a desert near what is known as Death Valley, and printed on the object glass is a photograph of every object within range of where they had been lying. Every leaf and stalk are distinctly marked, and the pictures occupy a position about the centre of each of the object glasses, but a little nearer the plane than the convex side. We should be inclined to think that this tale will have to be taken with a very large grain of salt.

The New York photographers are busy just now in photographing lap-dogs, a fashion in this direction having set in. Their terms for the operation are the same as for babies.

Mr. Jennings' series of exceptionally practical articles on photographing microscopic objects is by far the most practical monograph on the subject yet produced. The series, which commenced a month ago, is now about half through.

The clause in a recent Act of Parliament, making it illegal for a tradesman to use the Royal arms without special authority, was doubtless intended to remain a dead letter; and indeed it has remained a dead letter. Our readers will therefore be somewhat surprised to hear that a summons under the clause in question has been applied for against Messrs. A. and G. Taylor, photographers, of Regent Street, and we are sure that all readers of the NEWS will be pained to learn that the prosecution is at the instance of another photographer. It is said that the case will be heard at the Marlborough Street Police Court on Tuesday, the 30th instant, at 2 p.m.

Here is an instance of touching modesty. A nursemaid with an infant of about six months old in her arms called at a studio a few weeks ago, and asked to see the photographer. "I am the photographer," replied the proprietor. "Oh!" said the young person, in some confusion, "I understood it was a lady who took the portraits." "No, it is not a lady; but does that make any difference?" naturally enquired the photographer. "Oh! yes; the baby's mamma particularly wants his legs photographed—but—but she thought it was a lady who did them." And the young person precipitately retired, whether to seek out a lady photographer cannot be said; but she never came back.

A society journal writes thus enthusiastically of a well-known West End studio:—"The visitor to the studio can at once see, when the light is cast on the face of one of the attendants in the studio in order to exemplify the process, how the shades are expunged, and a marble-like clear physiognomy is exposed to the lens." An "expunged shade" is good.

The fact that a number of street hawkers at Edinburgh realised so much by selling penny photographs of the Premier during the week in which he delivered his Midlothian speeches is not only a significant political fact, but is another instance of the development of the photographic art. At the last general election there were at least two cases in which a candidate issued a copy of his carte-de-visite to every elector. At the next general struggle their example will probably be followed by many of the better-looking of the candidates, who will doubtless argue that if they wish to obtain the countenance of the constituencies, a suitable preliminary step is for them to present these constituencies with theirs.

In France the use of photography as a means of helping on a political propaganda is by no means new; but the plan adopted by Paul Cassagnac and the other friends of Prince Victor, to promote his cause, is so novel that it has taken the French police authorities a considerable time to discover the *modus operandi*. An enthusiastic Victorite, it seems, furnished the funds required. Many thousands of cartes of Prince Victor in his uniform as an artillery soldier having been taken, they were placed for distribution in the middle of cheap packs of playing cards, which were re-sealed and distributed in the country districts by reliable colporteurs or book-hawkers. Some thousands of these prepared packs have been prepared at Rouen and Orleans, and the new game, for the present, at all events, is played out.

Patent Intelligence.

Applications for Letters Patent.

12,329. Joseph Lyons, 34, Southampton Buildings, Chancery Lane, W.C., for "Improvements in stereoscopes, and in combining a lamp therewith."—Dated 12th September, 1884.

12,389. Josiah Thomas Chapman and Thomas Scott, 41, John Dalton Street, Manchester, for "Improvements in folding-cameras."—Dated 15th September, 1884.

Patent Sealed.

7746. Thomas Furnell, 1, Matlock Villas, Lordship Lane, East Dulwich, London, Surrey, Civil Engineer, for "An adjustable instantaneous shutter for photographic purposes."—Dated 15th May, 1884.

Specification Published during the Week.

5947. George Rydill, of 52, Chancery Lane, in the county of Middlesex, "Improvements in the preparation of photographs, or the treatment of drawings or designs printed on paper, or

other suitable material, for the purpose of imitating stained, ground, cut, or embossed glass, or to be employed for other useful or ornamental purposes."—Dated 30th June, 1884.

This invention consists in producing, treating, and applying photographs, printed drawings, or designs, either upon sensitized white, tinted, or coloured paper, satin, cotton, linen, parchment, glass, wood, or other suitable material, printed or produced from glass negatives, wood blocks, stone, metal, glass, engraved or etched metal plate, or by any of the known methods of printing in one or more colours.

The claiming clauses of the specification, which itself is very long, are as follows:—

1. The treatment of photographic or other prints or paper in a vessel with piue or other oil, or varnish, as described, under hydraulic, vacuum, or air pressure, to make the same translucent and preserve the colour.

2. Printing photographs or other printings on the back, either before or after they are made translucent, and on another paper, to finish the picture, is printed on the face side a background, or the background may be printed on the face side of the photograph.

3. Placing photographs betwixt two sheets of glass, and cementing the edges together.

4. Placing a printed design on the back of a photograph mount.

5. Printing photographs on both sides of sensitized paper at one time by the use of two photographic negatives.

6. Cutting out photographs to be placed on a background, or cutting out coloured paper or material to be placed behind translucent photographs.

7. Placing material or designs on the back of looking-glasses, also placing a border on the front or back side, and enclosing the same betwixt sheets of glass, and cementing the edges together as described.

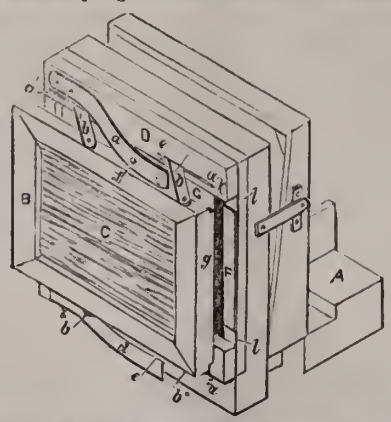
8. Placing transfer borders in imitation of stained glass, or placing designs on glass to imitate stained glass, so as to be cut with a diamond as described, and for the ornamentation of glass shades.

Patents Granted in America.

304,406. THOMAS HENRY BLAIR, Boston, Mass., "Camera-box." Filed April 14, 1884. (No model.)

Claim.—1. The combination of the box A, spring-actuated frame B, with the pivotted links *b b' b² b³*, springs *d d*, pins *c c*, and stud *f*, all substantially as and for purposes stated.

2. In camera-box, the combination, with rear frame, D, and packing, *g*, of the spring-actuated movable focussing-frame D,



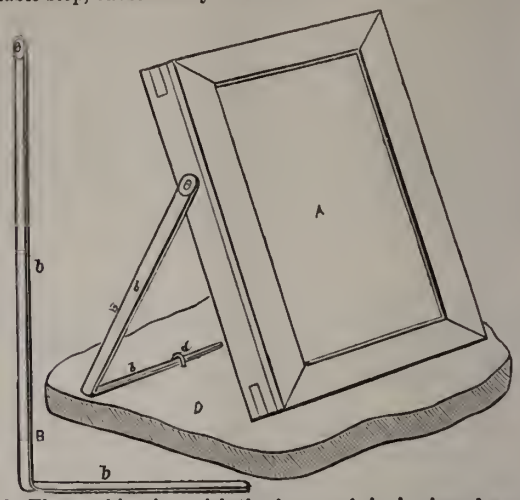
and plate-holder E, substantially as described, whereby light is entirely excluded when exposure is made, as stated.

3. The combination, with a camera-box, as herein described, of the plate-holder E, with its flap *i* and depressions *j j*, as and for purposes set forth.

4. The plate-holder E, constructed with the parts as described, consisting of the ears *q q* and flap *i*, with the spring *r*, as and for purposes herein set forth.

304,421. FRANK FRENCH, Lawrence, Kans., "Photographic printing-frame."—Filed May 7, 1884. (No model.)

Claim.—1. A support for photographic printing-frames, composed of the side arm pivoted at one end to the frame, and the base-arm extended at right angles from the opposite end of the side arm, and adapted to be inserted through a staple or other suitable stop, substantially as set forth.



2. The combination, with the frame, of the L-shaped support having its side arm pivoted at one end to the frame, and its base-arm extended at right angles from the opposite end of said arm, and adapted to be inserted through a staple or eye, substantially as and for the purposes specified.

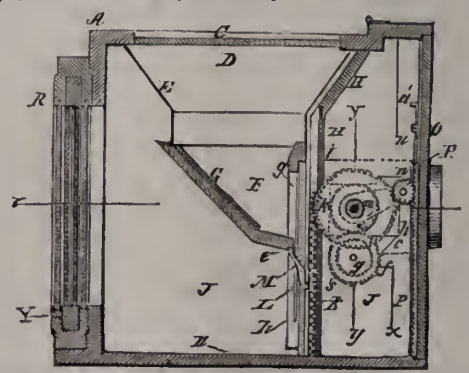
304,503. WALTER CLARK, New York, N.Y., "Photographic camera." Filed Jan. 17, 1884. (No model).

Claim.—1. In a photographic camera in which are combined an adjustable lens, a device for holding and exposing the sensitive plate at the back of the lens, a focussing glass in the side or top of the camera-box, and a reflector for throwing the image upon the focussing-glass, the camera-box constructed with a stationary partition in advance of the reflector dividing the box into front and rear compartments, and serving to carry the lens tube or case, substantially as specified.

2. The camera-box provided with a partition dividing it into front and rear compartments, and having a lens-opening through it, in combination with a movable mirror-case arranged at the back of said partition, and a focussing-glass in the top or side of the box, essentially as and for the purposes herein set forth.

3. The camera-box constructed with front and rear compartments, J J', and having a lens-opening between them, in combination with the movable inclined mirror-case F, arranged at the back of the front one, J', of said compartments, and provided with an opening and closing diaphragm, L, in its front, substantially as specified.

4. The combination, with the movable mirror-case F and its opening and closing diaphragm L, constructed to lift said case after closing it, of the sliding rack K, connected with said diaphragm, and the catch M, essentially as described.



5. The combination, with the camera-box compartments J J', the movable mirror-case F, having an opening and closing diaphragm, L, and the drop-shutter of the camera, of mechanism arranged within the forward compartment, J', for operating said case, diaphragm, and shutter, substantially as specified.

6. The combination, with the partition H, dividing the camera-box into front and rear compartments, J J', of the rack

K, fitted to slide in or on said position, the gear-wheel *k*, operating said rack, and the mirror-case F and its opening and closing diaphragm L, moved by said rack, essentially as described.

7. The sleeve *m* and spindle *c'*, arranged for operation from the exterior of the box, in combination with the gears *k n e' f' g'* and the racks K, P, and *h'* within the box, the movable mirror-case F, its opening and closing diaphragm L, the shutter N, and the adjustable lens of the camera, substantially as specified.

8. The circularly-shaped vibratory shutter N, having a notch, *r*, in combination with the spring-catch *u*, the spring-catch or lifter *t*, and the rack P, with its finger *s*, substantially as described.

9. The vibratory drop-shutter N, in combination with its controlling-spring *i*, spring-arm *l'*, and bracket or plate *k'*, essentially as and for the purpose described.

A SHORT PHOTOGRAPHIC TRIP IN INDIA.

BY CHAS. R. PANCOAST.

Having occasion last winter to visit India in connection with some exhibits at the Calcutta International Exhibition, I considered the opportunity of indulging my favourite pastime too good a one to be overlooked. Past experience having given me little or no confidence in our gelatine plates, and never having attempted their manufacture myself, I decided to "pin my faith" on those of some first-class English maker. As a last resort, in case gelatine should fail, I took a quantity of washed collodion emulsion; this I knew would work well, and be less liable to trouble from the great heat. Upon arriving in London, I did the "correct thing" in the eyes of most American amateurs—namely, order one of Mr. George Hare's improved cameras, and much credit is due to that gentleman for the promptness with which he executed the order. My outfit, therefore, including what I brought from home, consisted of a "Hare" 6½ by 4¾ camera and changing-box, one 5-inch Ross portable symmetrical, one 7½-inch Ross rapid symmetrical, and one 11-inch Dallmeyer rapid rectilinear lens; the latter lenses being fitted with shutters for instantaneous work. Of plates, I purchased those of Wratten and Wainwright, of the "Instantaneous" and "Ordinary" brands. Apparatus and chemicals for developing completed the list. As India was to me a terra incognita, I felt uncertain as to the working of gelatine, but as others had done so successfully, I felt disposed to give it a thorough trial.

The outward voyage on the P. and O. steamer *Ganges* afforded a few opportunities for work; the first of these was at Malta, where a stop of five hours enabled me to make a few pictures of the prominent objects of interest in Valetta. There are a number of professional photographers here who make fairly good work, but, I fear, cannot do so to any profit at the rate of 8d. for 12 by 10 unmounted prints. On leaving Malta Harbour, some excellent instantaneous work can be made from the steamer with Fort St. Elmo as a principal feature. Port Said, our next stop, afforded more opportunities, and some picturesque groups of Arabs rewarded my efforts. After this, little or no work was done save one or two "drop" pictures in the Suez Canal, and an occasional group of passengers or officers. As soon as possible, after establishing myself at the Great Eastern Hotel in Calcutta, I set about developing the plates exposed on the outward voyage. In order to obtain moderately cold water without using ice, I purchased a few porous earthen jars, the evaporation from which kept the contents sufficiently cool for all practical purposes. In fact, I did not experience the least "frill" even when the thermometer registered over 85°. By means of a rubber tube and clip, the water could be syphoned from the jars as readily as drawn from a tap. My formula for development, though nothing new, has the merit of simplicity and ease of manipulation:—

Pyro	2 grs. to 1 oz.	water
Citric acid	¼-gr. to 1 oz.	,,

Mixed fresh just before use.

Strong aqua ammonia	1 ounce
Water	1 ,,
Bromide potas.	60 grains
Water	1 ounce

I usually immerse the plate in the "pyro" for two or three minutes, then the addition of ten drops each of the ammonia and bromide suffice to complete development. Any variation of time can be compensated by increasing or decreasing the proportions of ammonia and bromide. Previous to fixing, I always allow the plate to remain at least five minutes in a strong solution of alum, containing five per cent. of oxalic acid. This tends not only to harden the film, but removes any of the stain occasioned by the pyro. Subsequent to fixing, a second alum bath removes any traces of "bypo" that may be left. This formula in my hands gives entire satisfaction, and seems to be equally well adapted to the various makes of plates. I always developed at night, partly from the lessened liability to danger from light, and from the fact that it was much cooler. M. Joubert, the director-general of the Exhibition, through his secretary, Mr. Walpole, kindly gave me the needed permission to make pictures in the Exhibition, and as the Indian building teemed with rare and beautiful subjects, I was not slow in availing myself of every opportunity. As many of the courts were but dimly lighted, I experienced at first a great difficulty in focussing, until a plan suggested itself which answered admirably. By taking the camera outside, and placing it at a distance from some object (preferably one having fine lines) equal to the average distance of the objects required in the picture, and focussing carefully with a large stop. Then, taking the instrument back in the building, and being careful not to disturb the focus, I was enabled to secure pictures of great sharpness, and without the severe strain on the eyes occasioned by working in a dimly-lighted interior. With the "Instantaneous" plates, I found one half-hour to be about the correct time, working the 4 stop of the 5-inch portable symmetrical.

The exhibits embraced collections from all the provinces of the Indian Empire, many of them of rare beauty and great value; those from Burmah, Punjab, Bombay and the North-West Provinces, and Oudh, making the most artistic and attractive pictures. The private exhibits of a firm of Chinese merchants in Calcutta, and that of a firm in Yokohama, were indeed beautiful, and afforded some rare and interesting bits; notably in the latter exhibit, a remarkable carved figure of the so-called wild man of Japan. This was considered by critics to be the finest specimen of wood carving of the modern Japanese workers, and was purchased by a noted connoisseur (the "Mr. Isaacs," of book fame) at a price approximating £1,600.

The government exhibits were large and varied, showing the high state of perfection to which the various details had been carried by native workmen under intelligent European supervision. While in Calcutta, I made the acquaintance of Major J. Waterhouse, to whose kindness and courtesy much of the pleasure of my stay was due. Having charge of the photographic branch of the Survey of India, he has brought the reproduction of maps and drawings by photo-zincography to a perfection I hardly deemed possible. I greatly enjoyed inspecting his establishment, and was everywhere impressed by the completeness of the details. He has lately been experimenting in the manufacture of gelatine plates, and, judging from the results shown, should say he was on the high road to success.

When not engaged in the Exhibition, I did considerable photographic work in and around the city, especially some street and river views. In these, I was greatly assisted by a "brother amateur," whose acquaintance I made in the Exhibition. His knowledge of the vernacular enabled me to secure a large number of studies that would otherwise have been impossible. A trip to the Royal Botanical Gardens at Seebpore well repaid the time and trouble, as there are many beautiful foliage effects. The great banyan tree, one of the largest of its kind in the world, is an interesting and curious subject. Eden Gardens, the Hyde Park of Calcutta, afford a few fine bits for the camera,

notably a Burmese pagoda, and a stone arch bridge overhung by beautiful trees. From the top of the Ochterlong Monument in the Maidan, a good panoramic view of the city can be obtained. To the south the Exhibition grounds, with the Museum building in the background: to the west the long stretch of the Maidan, with Eden Gardens and the Hoogly River in the distance; to the north, the business portion of the city, with the government building in the foreground, and the high dome of the post office in the distance; to the east, a portion of the native quarter, and Chowinghee Road in the foreground. From Calcutta I made a short excursion to Darjeeling. A succession of cloudy days prevented any photographic work, a fact I greatly regretted, as the scenery in the Himalaya Mountains is grand beyond description. The narrow guage railroad up the mountains is a grand piece of engineering work; in many cases the road is located close to the edge of a precipice, where a broken rail might precipitate the whole train a distance of over one thousand feet. Upon my return to Calcutta, and the Exhibition on the eve of closing, I turned homewards, intending to stop in Agra and Delci *en route* Bombay. So far I had been greatly pleased with the working of the gelatine plates; there was a softness, uniformity, and freedom form halation, that was especially satisfactory. Some few washed collodion emulsion plates I prepared did not give as satifactory results as I had hoped, owing to the dust, the great annoyance of an Indian winter. The absence of high winds, and the prevalence of bright clear skies, rendered out-door work a pleasure.

While on the subject of plates, I might remark that the English makers would do well to pay more attention to the packing of their plates shipped to India, as it is by no means uncommon to find a package containing several broken or damaged ones. Having occasion to purchase plates, I was disgusted to find a large number broken and damaged. One gentleman informed me that in getting a lot of five dozen from a prominent maker he found every plate more or less damaged from the cause named. A very slight additional care on the part of the packers would obviate the difficulty.

To return. Upon reaching Agra I set to work industriously to capture as many of the beautiful subjects as my limited time would permit. Secundra, the tomb of the Emperor Akbar, first claimed attention. Situated in a large and well kept garden, it forms an attractive subject. Thanks to the government, these beautiful buildings are kept in perfect order, and free to all, save perhaps a small gratuity to the durwau, whose smiling face and profound salaam are indicative of "backsheesh." From Secundra I next visited Agra Fort, of which the Elephant Gate forms the most interesting subject. The material used in the construction of these buildings are a red sandstone and white marble; the effects when used separately or combined are very pleasing. Inside the spacious walls is a marvel of ancient architecture, the Moti Musjib, or Pearl Mosque. Nothing can exceed the wondrous beauty of the arches and carvings, the more so when we consider that it was constructed by a race of men we are wont to compare with savages. From an archway in the private audience hall a magnificent view of the valley of the River Jumna with the Taj is obtained. It is indeed a trying subject for lenses and plates.

On the following day, in company with an intelligent guide, I drove to the Taj Mahal. This vast mausolcum was built by the Emperor Shah Jaban as a resting place for his favourite wife, Mumtaz Mahal, and, though some 230 years old, is, I feel safe in saying, the handsomest edifice in the world constructed of white marble. It has suffered little or no decay, the elements only tending to bleach the stone to a greater whiteness. Again the wisdom of the Government is apparent in the careful restorations where needed, and the great pains taken to preserve the grounds and buildings in their original beauty. The exquisite carvings of the screen surrounding the tombs, and the inlaid work on the tombs themselves, challenge comparison with the best work of modern times. It may be equalled, but I doubt excelled. From the Taj I next visited the tomb of Itmad-ud-Dowlah; this, like the Taj, although much smaller and far less imposing, is constructed of marble, covered with elaborate carvings and costly inlaid work. The carved screen surrounding the cenotaph is a marvel of the stone-cutters' art, and second in beauty only to that in the Taj. The Jumma Musjid, or Great Mosque, is a picturesque subject, were it not that the great civilizers, the railway and the telegraph, conspire to spoil its beauty by placing their rails and wires in such a position as to render a satisfactory picture impossible. Delhi is but a few hours' ride from Agra, and, like it, abounds in photographic subjects. On the way to the celebrated Kutub Minar, I examined a curious monolith known as Feroze Shah's Pillar. It is some 30 feet in height and 30 inches in diameter, and from the inscriptions we were informed that it is over 2,000 years old. It is an interesting and curious subject. The tombs of Humayun and Sofdar Jung were in turn inspected and photographed. Although in point of architecture they are inferior to Secundra (Akbar's tomb), yet they are fine specimens of the buildings of the sixteenth century. The exquisite little marble tomb of Nizam-ud-Deen well repaid me for a tramp through the dirty passages of one of the old Delhi Forts. It seemed like a jewel in the midst of a heap of rubbish. The Kutub Minar is, indeed, a wonderful and beautiful monument, constructed, as are all the tombs and forts, of red sandstone and marble; it has stood the ravages of time to the extent of nearly six centuries, and apparently unscathed. Its designer, by so proportioning the height of the various stories, has given the effect of exaggerated perspective, so that it looks much higher than it really is. Its dimensions are—height 242 feet, diameter at base 50 feet, and tapering to 13 feet at the top. Close by are the ruins of an ancient mosque in which is located the world-famous Iron Pillar. Opinions regarding this are at such variance that I refrain from making any comments; suffice to say it, together with the ruins, afford some highly picturesque photographic studies. As a trip to the Kutub consumes one day, the next I devoted to objects of interest in the city proper, prominent among these being the Cashmere Gate, famous as being the point of final attack in the Sepoy Mutiny. Delhi Fort, like its counterpart at Agra, has many points of interest. The Diwan-i-Am, or Private Audience Hall, recently restored at great expense, is perhaps the finest building of its kind in India. Near by is the Pearl Mosque, especially constructed for the ladies of the Court, having private passages to the Zenana, so that the worshippers could enter without being observed by masculine eyes. It is smaller, but scarcely less beautiful, than the similar building at Agra. Being very desirous of photographing the interior of a Jcin temple, my guide volunteered to conduct me. On arriving, those in charge objected to the leather case containing my camera. After some discussion and promise of "backsheesh," I was permitted to take the camera in, although the case kept a solitary vigil outside. It might be well to note, in cases of this kind, that the leather bellows in a camera does not count. The Jumma Musjid, or Great Mosque, is, perhaps, the most imposing building of its kind in the world, and in capacity for worshippers is said to be second only to the great mosque at Cairo, Egypt.

Leaving Delhi, my next point was Bombay. Here, having a few days prior to the departure of the steamer, I employed them in making a few pictures of the principal buildings. Few American or European cities can boast of as fine public buildings as Bombay. They are large, airy, and especially well adapted to the wants of the Government, combined with great architectural beauty. The Elephanta Caves, on an island in Bombay Harbour, are wonderful evidences of the skill displayed by the ancient workmen. With the modern appliances for mining and blasting, the work would be by no means insignificant. Much of their

pictorial beauty has been marred by the partial destruction of the statues and images. With Bombay I closed the photographic work of the trip, and packed my plates for development on reaching home. The method I adopted was to cut narrow frames from thin cardboard the exact size of the plates, and placing one between each film surface. By cutting these in one piece, although wasteful, an even bearing is obtained for each plate, and a much firmer package made than when these frames are made of narrow strips pasted together at the corners. After wrapping several thicknesses of non-actinic paper around the plates, I put them in cardboard boxes, giving these several folds of heavy wrapping paper. By giving care and attention to the packing, I was able, despite the rough handling incident to ocean travel, to take all my plates to America without a single fracture. Soon after arrival, I developed the plates exposed on my tour across India, and of the seventy plates exposed, only one proved a failure (a dark interior, from under-timing), and I could see no difference between them and those exposed and developed on the spot. It is, indeed, satisfactory to know that sensitive plates can be made in England, exposed in India, and developed in America, without the slightest deterioration.

Much has been said concerning the Indian climate, but in the winter months it is simply delightful, and closely resembling in temperature a cool American summer. On the whole, I greatly enjoyed my visit, and especially so as my photographic work proved so successful.

VOYAGE OF THE "MONARCH" BALLOON.

BY CECIL V. SHADBOLT.

We left the Artillery Grounds at about 4·15 p.m., the "Colonel" balloon having been despatched some ten minutes previously. As we gradually rose above the bricks and mortar of Finsbury, the extraordinary interest manifested in the afternoon's proceedings became very evident. Dense masses of people thronged not only the grounds from which we ascended, but every point of vantage in the neighbourhood appeared to be occupied; windows were crowded, housetops thickly packed, and the streets below on all sides literally teemed with thousands and thousands of human beings, the sight of whom, as we slowly and steadily mounted upwards, was one not easily to be forgotten.

The view was simply superb. Below us lay the whole of London stretched out in maplike beauty, with its grand and mighty buildings dwarfed into mere toys. There was the noble Cathedral of St. Paul, with its dome resembling the proportions of the thick end of a gigantic egg: further on, the Victoria Tower of the Houses of Parliament stood out boldly like an ornamental match box, and a little square-sided set of buildings with an open space in the centre, the whole appearing of dimensions almost suitable for the waistcoat pocket, was soon recognized as Somerset House.

Thus our eyes wandered from point to point as we glided upwards and onwards, now puzzled as to the individuality of this or that building which appeared to stand out more prominently than the rest, and now gratified by the recognition by one or other of us of the various places of interest which we were able from time to time to identify, as the vast pile of outstretched metropolis of the world gradually passed in panoramic procession beneath us.

At 4.25 we were directly over Regent's Park at an altitude of 2,500 feet, and at 4.44 we sighted the "Robin Hood," which had just risen, and for which we had for some time been watching; while in the opposite direction the "Colonel" could readily be distinguished in the far-off distance, both balloons appearing about the size of peas. Our course then lay almost straight over the picturesque suburb of Harrow-on-the-Hill, and thus we sped onwards on our aerial journey. Somewhat later, on again looking round for the "Robin Hood," that balloon was no more to be seen, its aeronauts having effected a descent near Sudbury, over which district we had ourselves passed some time previously.

On nearing Harefield, our supply of ballast having become reduced to one and a half bags only, it became necessary to terminate our journey, which we did at 5.15, after a run of 18½ miles, by bringing down the "Monarch" in a field close to that village.

A PHOTOGRAPHIC WALKING TOUR IN WALES.

BY CHARLES E. ABNEY, B.A.*

Having been requested to write a paper for this Society, and only having a short time for this purpose, I have decided to write on the subject of my holiday. It may interest at least some of my amateur brethren, and perhaps give them a wrinkle for the future when they are meditating on what to do with themselves during their holidays. Last Easter, a friend and I were talking over our coming holidays, and it struck us that nothing would be better than to have a short walking tour in Wales, and the matter was then and there decided. As the time drew near for our holiday, I confess to feeling a considerable amount of pleasurable excitement in getting my traps ready. I may as well at once describe the photographic kit which I took with me. In the first place, I took a 5 by 4 camera, by Watson and Sons, fitted with three double backs. The lens was of the rectilinear type, of foreign make, I believe, and having a back focus of 7½ inches; it is a most excellent lens, although it wants the maker's name. The camera, lens, and back were fitted into a case of American cloth, and the legs were of a light folding pattern. The camera, legs, &c., weighed about eight pounds. For changing plates, I took with me a folding lantern which I obtained from Mr. Werge, of Berners Street, London. I consider the lantern is so excellent both for changing plates and developing by, and so very portable, that I have brought it for the inspection of the Society. Besides the plates which I took with me, I took a few empty boxes, and paper for packing exposed plates in. And here let me give a word of advice to those who wish to carry plates safely when travelling, viz., let them pack them in their portmanteaus between articles of clothing. I did this, and although our luggage frequently had very rough treatment, I did not have one plate broken.

At last the eventful day (the 4th of August) arrived, and we started from Derby for Conway. As you all know what the weather was at that time, I need not tell you what our journey was like. We arrived at Conway a little after three o'clock, and after making arrangements for dinner and beds, I, the impatient photographer, felt bound to rush off and photograph the well-known Castle. I first went inside, as I wished to have a shot at the interior of Banquetting Hall, or whatever they call it, but unfortunately I found my lens was too long in focus to get what I wanted. After trying every position, I reluctantly left the interior to try my luck outside. I took two views of the Castle; one from near the entrance, the other from the shore. These two views are shown in the prints (Nos. 1 and 2.) The next morning we started off to walk from Conway to Bettws-y-Coed, by the right bank of the river Conway; the walk is a very beautiful one, but for the first few miles I did not light upon any subject for my camera. After we had gone about six miles, we came upon a man with a cart going to Llanrwst with empty soda water bottles. This good Samaritan offered us a lift, which we thankfully accepted, as we were nearly melted; and seated on boxes full of empty soda water bottles, we made a triumphant entry into Llanrwst; there I had my first shot for the day, and secured a good photograph of Llanrwst Bridge from the river; this is print No. 3.

Resuming our journey, in about three and a-half miles more we reached the old bridge called Pont-y-pair, at Bettws-y-Coed. I at once attacked the bridge, and then took a shot from the bridge looking up the stream, the Llugwy; the results are shown in prints 4 and 5. The next view I took (No. 6) was of the stream in front of the "Royal Oak Inn," while my companion went on to secure rooms, and see after the luggage. After luncheon, we determined that we would go and see the well-known Miners' Bridge. This bridge I consider a decided fraud. In former days it was a strong ladder reared from one edge of the stream to the top of the bank on the opposite side, and there might have been something curious, if not picturesque, about it;

* Read before the Derby Photographic Society.

but at the present date it is merely a wooden bridge with a hand-rail at each side, and is neither curious nor picturesque. However, I got two nice views (Nos. 7 and 8) of the stream near the bridge. The next morning we were up early and started for the Fairy Glen. Unfortunately, the light came the wrong way for getting the best photographs of the upper part of the glen—an afternoon light would have been better. However, I got two pictures of that part (Nos. 9 and 10), which were good, considering that the sunlight was almost coming full into the lens. I got three pictures of the lower part of the Glen (Nos. 11, 12, and 13), for which the light was better. We then returned to our hotel, and on the way back I got a view from a field just below the Waterloo Bridge (No. 14). When we got back to our hotel, I made enquiries as to a cellar in which I could change my plates. They took me to the so-called cellar, but, when I got there, I found that it was not underground, and that floods of white light kept streaming in from different parts. This looked bad. However, my friend and I took off our coats, and, after a great deal of trouble, we managed therewith to block out the greater part of the light, and then proceeded to change my plates in fear and trembling. If any plates ran a chance of being fogged, mine certainly did on that occasion. However, "all's well that ends well," and the negatives developed as brilliantly as one could desire. After lunch we started for Pandy Mill. I took duplicate photographs of the mill, and show a print from one of the negatives (No. 15); and I then took a picture (No. 16) of the bridge below the mill, which would have been improved if the sun would have kindly got under a cloud for a few seconds. We then went on to Conway Fall, of which I also took duplicate negatives; both negatives were fair, and I show a print from one (No. 17). On our way back to the hotel we came across a lovely pool of water, where we could get a plunge into fifteen or twenty feet of water. We made a mental note of this place. Next morning we were up early, and started off for our pool; there we had a most luxurious bathe before anyone was about. You may fancy the luxury of such a bath during the tropical weather we were having. After breakfast we started by coach, intending to drive to Pen-y-gwred; but at Capel Curig we were so charmed with the scenery that we determined to leave the coach, and photograph. Here I got two photographs (Nos. 18 and 19), one of the stream with rustic bridge, and the other of the stream and trees, with Moel Siabod in the distance. After this we began the hottest walk we had during the whole of our tour. During the whole of our walk from Capel Curig to Pen-y-gwred there was not an atom of shade, and the heat was intense. How grateful was the shandy-gaff when we reached our hotel! I took one photograph only (No. 20) on this part of our walk.

I had wished to get a good view of Snowdon from this part of the road, but there was a heat haze over the mountain which foiled my intentions. After luncheon we started down the Pass of Llanberis, and here I took three photographs, two of which I show, Nos. 21 and 22. The third, which was very good, I unfortunately managed to scratch after it was finished, and it is utterly spoilt. After spending that night at Pen-y-gwred, we started off on our way to Beddgelert, through the lovely vale of Gwynant, past the Lakes of Gwynant and Dinas; this I consider to be the loveliest part of our whole tour. I show three views of the Lake of Gwynant, Nos. 23, 24, and 25, and one of Lake Dinas, No. 26. When close to Beddgelert I had another shot. I hardly know what to name the view, so I have called it a view near Beddgelert, No. 27. We put up at the well-known Goat Hotel. After a short rest, we explored Beddgelert and its surroundings, but I did not take any more photographs, as I did not care again to risk changing my plates in the daytime. The next day we started off to walk over the mountains to Pan-y-Butch. I had two shots at the Pass of Aberglaslyn, before we struck off into the mountain path. I show one of these views, No. 28; the other was much over-exposed.

The walk over the mountains is exceedingly beautiful, and I cannot speak too highly of the charms of a certain mountain stream which we came across. There was a lovely deep pool under a bridge, and I should think we amused ourselves for over an hour bathing in this said pool. I show one photograph taken on this walk, No. 29, taken from a place called Croesor. At the end of this walk we came to the Oakley Arms at Tan-y-Bwtch, which is a quaint old inn, and is well worth a visit.

Next day was Sunday, and intensely hot, so the only exercise we took in the daytime was to stroll about the beautiful grounds of the Oakley family. In the evening we took the mail car to Festiniog, and thence went by rail to Dolwyd Ielan; from this place we walked by Pont-y-Pant to Betts-y-Coed, and I only regretted that it was late in the evening, for the scenery was beautiful. The next morning, after a bathe in our favourite pool, we set off for the Swallow Falls; but, alas! on our arrival there, just as I was setting up the camera, down I fell with it on to the rocks; the camera was an utter wreck, and one of my legs was damaged. However, I cared more for the camera than I did about my leg, for I was just about to attempt some lovely pictures.

This ended our tour, and we came back. In conclusion, I may say that my exposures ranged between one second and two minutes, and that the quantity of soda and milk which we swallowed would have floated a good sized fishing smack.

Correspondence.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

DEAR SIR,—Will you kindly permit me to remind intending exhibitors that packing-cases from the country must reach our agent, Mr. Bourlet, at 17, Nassau Street, Middlesex Hospital, London, not later than Thursday next, September 25th; but it would be better if they could be despatched so as to arrive in London a day or two before that date; also that pictures delivered by hand must be left at the Gallery, 5A, Pall Mall East, on Thursday, September 25th (open until 9 p.m.)

Any information respecting the Exhibition, as also slides for the Monday evenings with the optical lantern, may be obtained from yours truly,

EDWIN COCKING, Assistant Secretary,

57, *Queen's Road, Peckham, S.E.*

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 11th inst., Mr. W. COBB in the chair.

Mr. A. COWAN opened a discussion on developers by showing plates treated with the mixed carbonates of potash and soda. These were somewhat yellow, and he said that Mr. Ashman had developed some of the same batch with soda, and obtained black images.

Mr. W. E. DEBENHAM preferred clearer shadows than these negatives presented, and thought the veil was an objection.

The CHAIRMAN differed in this respect; he thought a slight deposit all over the plate was an advantage to be sought after; an opinion supported also by Mr. Cowan.

Mr. W. M. ASHMAN then passed round the plates which had been sent for development, and explained that for a powerful developer, such as the one used (Monroe formulæ, page 477 of the present volume), the plates had been over-exposed; they were certainly not yellow. He also showed several negatives on Mr. Henderson's plates, as examples of what the developer was capable of; in no case was there any discolouration.

The CHAIRMAN said there appeared a very distinct difference of opinion on the subject; it was plain that soda could be used without getting yellow negatives. Perhaps it might turn out that there was some difference in the samples of soda employed.

Mr. COWAN used the proportions recommended in the original formulæ, and obtained the crystallized carbonates from a well-known house.

Mr. ASHMAN employed ordinary household washing soda. Before using, it was crushed, and exposed a few days to the air.

Mr. DEBENHAM thought it probable that this treatment might change its composition into a sesquicarbonate. But Mr. Haddon held that efflorescence only took place, thus giving a more constant quantity of alkali.

Mr. DEBENHAM could see no advantage in driving off the water of crystallization in this case.

Mr. ASHMAN said that there was a certain proportion of sulphite of soda mixed with the alkali, as well as the portion added to the pyro and acidified with sulphurous acid, and thought it important to use the relative proportions recommended.

Mr. Cowan then showed the results of experiments with lactic acid in the ordinary ammouia developer (see page 542), and could not find any advantage by the addition. The sample had been put into his hands by the chairman, and it was said to be an accelerator, but he could show that it was not. Four plates were exposed the same time, and developed as follows: No. 1. Ordinary pyro, ammonia, and bromide; No. 2. Similar developer with one-half as much lactic acid as pyro added; No. 3. Lactic acid doubled; No. 4. Lactic acid, equal to double the quantity of pyro used. No. 1 developed in forty seconds; No. 4 in two minutes, the others intermediary. It acted very similar to bromide in restraining full exposure, No. 4 being very dense, but no gain in detail.

The Chairman had not found lactic acid to be an accelerator as claimed, but it conferred a quality on the plates which he liked very much. A professional friend, to whom he sent a sample, had expressed similar sentiments to those of Mr. Cowan regarding it.

Mr. Debenham would expect the developer to be slowed, owing to lactate of ammonia formiug.

Mr. Haddon said the fairest way to test its real value would be to form it into lactate of ammonia before use.

Mr. G. Waltenberg enquired the cause and remedy for a number of blisters in a sample of plates he had been using lately. When dry, they resembled small rings in relief.

Mr. Debenham said that it was a case of frilling in the incipient stage, which could be avoided by soaking the plate in alcohol before drying.

Mr. Waltenberg had tried that, but it did not have the desired effect.

The Chairman and others had met with the same kind of markings, and Mr. Monle could discern the marks after transferring the film to another plate.

Mr. Cowan recommended soaking the plate in a saturated solution of chrome alum before fixing.

In reply to Mr. Haddon, regarding the best proportion of chrome alum to add to an emulsion,

Mr. Cowan said $\frac{1}{8}$th of a grain was ample; a quarter of a grain would render an emulsion almost insoluble. He also showed a sample of fine silver wire gauze suitable for filtering emulsions, sent by M. Stebbing (Paris).

Derby Photographic Society.

On Wednesday, September 3rd, a meeting was held at the London Restaurant, Derby, the President, Captain Abney, R.E., F.R.S., in the chair.

The minutes of the previous meeting were read and confirmed.

Captain Abney then gave a short address on photography generally, and proposed that subjects for study be instituted, the results to be produced at the next quarterly meeting.

The subjects chosen were:—

1. "An Autumn Evening."
2. "Still Life."
3. "Animal Study."
4. "Rest," Life Study.

A sub-committee consisting of Messrs. R. Keene, J. Merry, A. J. Cox, and the Hon. Secretary, were appointed to consider the conditions.

Mr. Charles E. Abney, B.A., Vice-President, then read a paper on "A Photographic Walking Tour in Wales" (see page 605).

A conversation next ensued as to arrangements for technical meetings for practical demonstrations, the matter being referred to the committee of management.

A cordial vote of thanks to Captain Abney for presiding, and for his address, and also to Mr. Charles E. Abney for his paper, brought the proceedings to a close.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday next, September 23rd, at the Gallery, 5a, Pall Mall East, at eight p.m.

The Centenary Balloon Ascent.—In accordance with the arrangements referred to last week, the ascents took place on Monday last from the ground of the Honourable Artillery Company. Three balloons rose. The first to ascend was the "Colonel," celebrated for having made four voyages across the Channel. Accompanying General Brine in his ascent were Captain Bayliss, H.A.C., and Mons. Lhoste, Secretaire de L'Academie d'Aérostation Météreologique of Paris. The last-named gentleman was announced to ascend in his balloon the "Ville de Boulogne," which has twice crossed the Channel; but, as his balloon had not arrived, he consented to go with General Brine. At a few minutes after four o'clock the "Colonel" ascended, amid the cheers of the assembled crowd, and, as the balloon rose majestically in the air, M. Lhoste stood on one foot on the edge of the car, and, holding with one hand by the ring above, with the other hand waved his hat and hurrahed. The balloon, rising rapidly the while, travelled away in a north-westerly direction, and again, at a great height, M. Lhoste could be seen repeating his venturesome performance. Shortly afterwards the "Monarch" went up, Mr. Dale being accompanied by Mr. Shadbolt and Mr. Hammet. When let go, the balloon for a moment seemed too heavily weighted to rise quickly, but some sand being thrown out, the machine soon shot up into the air, and sailed away in the wake of the "Colonel," the latter then appearing at a great distance mere speck in the air. It was a quarter to five o'clock when the "Robin Hood" ascended with Mr. Youens and Sergeant Louch, and a quarter of an hour later all the balloons were lost to the sight of the assemblage on the grounds. There was afterwards a fire-extinguishing experiment with a hand-grenade fire-extinguisher, consisting of a glass flask containing a pint of fire-extinguishing fluid. The "Monarch" came down at Harefield, in Middlesex, at a quarter past five p.m., all well, and an account of the trip will be found on page 605. On the previous Saturday Mr. Shadbolt and Mr. Dale ascended in the "Monarch" from Ramsgate.

At the *Exposition Regionale de Rouen*, a silver medal has been awarded to the "Compagnie Anglaise Tebbit" for the excellence of their manufacture of dry plates, and special mention is made in the award of the splendid display of English landscapes and portraits by Messrs. McLeish, Slingsby, Marsh Bros., and Renwick.

Effects of Light on the Respiration of Oxygen by Plants. By J. Reinke (*Bied. Centr.*, 1884, 37—39).—The author's experiments were limited to the observation of the amount of gas exhaled during varying amounts of sunshine: the evolution of gas begins when the light is fairly strong, and increases as the light becomes more intense, until the maximum is reached. This corresponds with the moment of direct sunlight; further intensification of light prolongs the evolution of gas, but does not increase its rapidity; and when the rays are concentrated by a lens, the process proceeds in this way until the chlorophyll is destroyed.—*Journal of the Chemical Society.*

Sharp Practice.—*Walzl's Monthly* says:—"We learn from the *N. Y. Tribune* that a photographer of Berlin has been sent to the penitentiary for a fraud which would probably entitle him to be called a smart man in this country. He pretended that he could make photographs of gentlemen so life-like, that their dogs would be able to recognise them. When the photographs were held up before the dogs of the owners, the dogs would wag their tails and lick the pictures. The other photographers grew jealous. They watched their colleague, and finally discovered that he put a thin layer of lard over the picture, which the dogs, of course, smelled, and then licked off. We know not a few photographers in this country who might take a hint from this, for it is certain that the likeness in nine cases out of ten could be established in no other way. And lard is cheap. The new style of pictures might be called 'dog-uerreotpyes.'"

Photographic Club.—On September 24th the subject for discussion will be "The Development of Plates known to be Over-exposed." *A Special General Meeting* will be held on October 1st. Saturday out-door meeting at Kew; afterwards at Hotel on Kew Green nearest bridge.

To Correspondents.

*** We cannot undertake to return rejected communications.

H. Spink.—1. There is no reliable table in any cheap work, but we will do our best to supply the want. 2. See our volume for 1880, p. 344.

F. Francis.—The so-called "Marine glue" is best. Make the parts warm before applying it, and bind them tightly together with wire. When thoroughly cool, remove the wire. 2. It will answer very well indeed.

FORRESTER.—1. Both would require precisely the same exposure, as the $\frac{f}{16}$ diaphragm of the sixteen inch lens will have four times the area, or double the diameter of the $\frac{f}{16}$ diaphragm of the eight inch lens. 2. Any specifications that are not out of print can be purchased at the Sale Office in Cursitor Street, the prices ranging from twopence upwards, according to the amount of matter, and the number of drawings. 3. We do not think that such a lantern is an article of commerce, but any dealer in photographic apparatus will get it made for you. 4. This query will be answered by post.

FRED S. SEED.—If packed, send them, together with a short letter of description, to Photographic Society of Great Britain, care of Mr. James Bourlet, 17, Nassau Street, Middlesex Hospital, London. They must arrive not later than Thursday next, September 25th.

K. LLOYD.—All the materials can be obtained from the Autotype Company, Oxford Street; but we should recommend you not to obtain the carbon tissue ready-sensitised.

THOS. S. (Derby).—We will write. See notice as to latest time.

H. M.—It has been sent to you.

C. A. M. W.—As you put the case, it is rather difficult to deal satisfactorily with the problem; but we think that under the circumstances it might be well to cut a narrow strip off each plate, and put these side by side in a normal developer.

G. M. WINTER.—The gelatine film appears to be more or less completely dissolved away in parts, and this may arise from the heat of the weather. You might try soaking in a saturated solution of alum before applying the intensifying liquid.

J. S. S.—We certainly cannot judge as to the cause by merely inspecting a print: even if we had the negative, it would be very difficult to form an opinion.

K. H. E.—Information on the subject may be found scattered through the last six volumes of the NEWS, but nothing of real importance has been done as regards the application of the process to photography.

R. J. H.—We are under the impression that most of the large stock-houses keep it; if not, either one would doubtless obtain it for you.

B. JACOBS.—1. The process is far older than you suppose, and was fully described in the PHOTOGRAPHIC NEWS a quarter of a century ago. 2. Yes, while it is wet. 3. Glass is far better. 4. The double sulphate of iron and ammonia is sometimes preferred, but does not seem to possess very decided advantages over the simple iron salt. 5. Once having become insoluble, there is no means known by which it can be restored to its original condition.

ALARMED.—The registration should have been secured before any copies were sold; but if, as we gather from your letter, the photograph was made to the order of a customer, you never had any right to register it in your own name.

The Every-day Formulary.

THE GELATINO-BROMIDE PROCESS.

Emulsion.—A—Nit. silver 100 grains, dist. water 2 oz. B—Bromide potassium 85 grains, Nelson's No. 1 gelatine 20 grains, dist. water 1½ oz., a one per cent. mixture of hydrochloric acid and water 50 minims. C—Iodide potassium 8 grains, dist. water ½ oz. D—Hard gelatine 120 grains, water several oz. When the gelatine is thoroughly soaked, let all possible water be poured off D. A and B are now heated to about 120° Fahr., after which B is gradually added to A with constant agitation; C is then added. Heat in water bath for half an hour, and stir in D. After washing add ½ oz. alcohol.

Pyro. Developer.—No. 1—Strong liq. ammonia 1½ oz., bromide potassium 240 grains, water 80 oz. No. 2—Pyro. 30 grains, water 10 oz. In case of an ordinary exposure mix equal vol.

Iron Developer.—Potassium oxalate sol. (1 and 4) 80 parts, ferrous sulphate sol. (1 and 4) 20 parts, dist. water 20 parts. To each 4 oz. of the mixed developer add from 5 to 30 drops ten per cent. sol. potassium bromide, and 30 drops sol. sodium hyposulphite (1 and 200).

Substratum or Preliminary Preparation.—Soluble silicate of soda 1 part, white of egg 5 parts, water 60 parts. Beat to froth and filter.

Fixing.—Sat. sol. of sod. hypo. 1 pint, sat. sol. of alum 2 pints, mixed.

Cowell's Clearing Solution.—Alum 1 part, citric acid 2 parts, water 10 parts. Edwards makes this sherry coloured with perchloride iron.

Eder's Method of Intensification.—The negative is whitened by soaking in sat. sol. of mercuric chloride, and after thorough rinsing immersed in potass. cyan. 10 parts, potass. iod. 5 parts, mercuric chloride 5 parts, water 2,000 parts. As film becomes dark brown, the actinic opacity is increased; but prolonged action causes brown tint to become lighter, until at last the negative is no denser than at first.

Fol's Backing Sheets.—A chromographic paste is prepared with gelatine 1 part, water 2 parts, glycerine 1 part, and a very small addition of Indian ink. Strong paper or shirting is coated, and the sheets are laid, face downward, on waxed glass to set. Press to back of glass plate.

THE WET COLLODION PROCESS.

The Nitrate Bath.—Water 14 oz., nit. silver 1 oz., nitric acid 1 drop Before using coat a small plate, and immerse it for 20 minutes.

Cleaning Preparation for New Plates.—Alcohol 4 oz., Jeweller's rouge ½ oz., liquid ammonia ½ oz.

Film-removing Pickle for Old Plates.—Water 1 pint, sulphuric acid 4 fluid oz., bichromate potassium 4 oz.

Substratum.—Whites of 2 eggs well beaten, 6 pints of water, and 1 dr liq. amuion.

Negative Collodion for Iron Development.—Alcohol 1 pint, pyroxyline of suitable quality 250 grains, shake well and add ether 2 pints, *Iodize this by mixing with* one-third of its volume of alcohol ½ pint, iod. ammon. 80 grains, iod. cadm. 80 grains, brom. ammon. 40 grains.

Normal Iron Developer.—Water 10 oz., proto-sulphate iron ½ oz., glacial acetic acid ½ oz., alcohol ½ oz. The amount of proto-sulphate iron may be diminished to ¼ oz. when full contrasts are desired, or increased to 1 oz. when contrasts are unduly marked. With new bath quantity of acohol may be reduced to ¼ oz.; but when bath is old more is wanted.

Intensifying Solution.—Water 6 oz., citric acid 75 grains, pyro. 30 grains. When used, add a few drops of the silver bath to each ounce.

Lead Intensification.—After neg. washing, immerse in dist. water 100 parts, red prussiate potash 6 parts, and nit. lead 4 parts. When it is yellowish white wash and immerse in liquid sulphide ammon. 1 part, water 4 parts.

Fixing Solution.—1. Potass. cyanide 200 grains, water 10 oz. 2. Sat. sol. of sod. hypo.

Varnish.—Shellac 2 oz., sandarac 2 oz., Canada balsam 1 dr., oil of lavender 1 oz., alcohol 16 oz.

PAINTING PROCESSES.

Albumen Mixture for Paper.—White of egg 18 oz., 500 grs. ammon. chlor. in 2 oz. of water. Beat to a froth, stand, and filter.

Sensitizing Solution.—Nit. silver 50 grs., water 1 oz., sod. carb. ½ gr.

Acetate Toning Bath.—Cbl. gold 1 gr., acet. soda 20 grs., water 8 oz.

Lime do.—Chl. gold 1 gr., whiting 30 grs., boiling water 8 oz., sat. sol. chl. lime 1 drop. Filter cold.

Bicarbonate do.—Chl. gold 1 gr., bicarb. soda 3 grs., water 8 oz.

Fixing Bath.—Sodium hypo. 4 oz., water 1 pint, liq. ammon. 30 drops.

Reducer for Deep Prints.—Cyan. potass. 5 grs., liq. ammon. 5 drops, water 1 pint.

Sensitizing Bath for Carbon Tissue.—Bichromate potash 1½ oz., water 30 oz., ammonia 1 dr., methylated spirit 4 oz.

Enamel Collodion.—Tough pyroxyline 120 grs., methylated alcohol 10 oz., ether 10 oz., castor oil 20 drops.

Mountant.—1. Fresh solution of best white gum. 2. Fresh starch.

Collotypic Substratum.—Soluble glass 3 parts, white of egg 7 parts, water 10 parts.

Collotypic Sensitive Coating.—Bichromate potash ½ oz., gelatine 2½ oz., water 22 oz.

Collotypic Etching Fluid.—Glycerine 150 parts, ammonia 50 parts, saltpetre 5 parts, water 25 parts.

Printing on Fabric.—Remove all dressing from fabric by boiling in water containing a little potash, dry, and albumenize with ammonium chloride 2 grammes, water 250 cubic cents., and the white of 2 eggs, all being well beaten together. A 70-grain silver bath is used, and the remaining operations are as for paper.

Cyanotype Printing.—Water 1 oz., red prussiate of potash (ferricyanide) 1 dr., ammonio citrate of iron 1 dr. Prepare and preserve in the dark. Float the paper and dry. Fixation by mere soaking in water.

VARIOUS.

Luckardt's Retouching Varnish.—Alcohol 300 parts, sandarac 50 parts, camphor 5 parts, castor oil 10 parts, Venice turpentine 5 parts.

Matt Varnish.—Sandarac 18 parts, mastic 4 parts, ether 200 parts, benzole 80 to 100 parts.

Encaustic Paste.—Best white wax, in shreds, 1 oz., turpentine 5 oz. dissolve in gentle heat, and apply cold with piece of flannel.

FERROTYPES.

Collodion.—Ammonium iodide 35 grains, cadmium iodide 25 grains cadmium bromide 20 grains, pyroxyline 70 grains, alcohol 5 oz., ether 5 oz.

Bath.—Silver nitrate 1 oz., water 10 oz., nitric acid 1 drop.

Developer.—Ferrous sulphate 1 oz., glac. acetic acid 1 oz., water 16 oz.

Fixing and Varnish.—Same as wet collodion process.

The Photographic News Registry.

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Reception Room, & to learn mounting.—Miss Cook, *Photo. News* Office.
Printer & Operator, experienced.—J. E. M., 2, West-st, Osney, Oxford.
Operator, good copyist, &c.—C. O., 25, Duke-st., Bloomsbury.
Operator, good at posing, electric light.—G. S. M, 50, Green-st., Hyde-pk.
Improver, &c.—X. Y. Z., 69, Palace-garden-ter., Notting-hill-gate.

Employment Offered.

Printer, &c., winter engagement, 21 -.—J. Inskip, Scarboro'.
Printer, used to carbons.—M. Boucher, 15, King's-rd., Brighton.
Recep.-Room, & Retouch or Colour.—Mr. Stuart, 47, Brompton-rd., S.W.
Operator, good Retoucher (indoors).—C.D.V., *Photo. News* Office.
Apprentice or Improver, indoors.—T. Vipond, Grantham.
Youth as Improver.—2, The Pavement, Clapham Common.
Retoucher & Colourist.—F. R. Chapman, Clapham Common.
Assistant Operator (Dry-plate).—Barnes & Son, 422, Mile End-rd., E.

The Photographic News.

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THE SOLAR CLUB, 1859.

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THE PHOTOGRAPHIC NEWS.

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CONTENTS.

THE APPLIANCES USED IN WASHING GELATINE EMULSION.

AT more than one recent meeting of the London and Provincial Photographic Association there has been discussed the subject of the various materials suitable for making the gauze which is generally used for cutting emulsion into small fragments for washing.

The first improvement on the old method of scraping the emulsion into somewhat large fragments with a piece of glass consisted of the introduction of coarse canvas through which the emulsion was squeezed, and this method of operating remains a favourite one with many—both amateur and commercial plate makers—at the present day. Others find the canvas arrangement a rather "messy" one, and use a squeezer of one kind or another, the appliance always consisting of a plunger, which presses the emulsion against a piece of wire gauze, or against a series of thin metal bars. When first this arrangement was proposed, there appeared to be no doubt that it would be necessary to use silver or silver-coated wire to prevent there being any action on the emulsion. It is, however, to say the least of it, somewhat doubtful whether any such precaution is necessary.

Silver wire of sufficient thickness is expensive, and there is often difficulty in getting silver-coated wire. A member of the Association just mentioned, however, pointed out that the wire with which violincello strings are covered is silver-coated, that a "cello" string can be got for a few pence in almost any town, and that if the wire be unwound from it, there will be found to be a great length of the very thing which is considered by many to be so great a desideratum.

When the matter of this silver-coated wire was brought up, a member asked the somewhat pertinent question, "Had any one found any harm to result from the use of copper wire for pressing emulsion through, and if not, what was the object of all this searching after the silver-coated wire?" He himself had used copper wire for years, and had found no harm to result from it, although he had noticed that a gelatine emulsion with much free ammonia in it turned deep green if it remained in contact with copper for only a few seconds."

Several members had used copper wire, but none of them could say that they had discovered any evil results to arise from the use of it.

We may give our own experience of the results of copper wire gauze used as a material through which to press emulsion, and also of the results of the contact of another material —namely, wood—with a long succession of emulsions.

The squeezers for emulsion are themselves usually made of either silvered copper or vulcanite, the piston being of the same material as the cylinder. We were struck, however, some time ago with the simplicity of an arrangement which we saw in the hands of an amateur plate-maker. It was made entirely of wood. In place of the cylinder there was a square wooden tube, made by simply "sprigging" together four bits of board. The plunger was of solid wood in sections about an inch and a quarter square. On to the end of the square tube there was tacked a piece of copper wire gauze, through which to squeeze the emulsions.

We made a piece of apparatus of the kind we have described, and were very well pleased with the performance of it for more than a year. The copper appeared to have no deleterious action on the emulsion. After we had, however, used our squeezer repeatedly during the time mentioned—a year or so—we commenced to get green and red fog, working by a formula which had given us no such defects before. After casting about in various directions in search of a solution of the mystery, we bethought ourselves of the squeezer. It was not likely that the defect came from the copper wire, as if the copper had any deleterious action, it surely would not have waited for more than a year before showing it. To make certain, however, a new squeezer was constructed—that is to say, the wooden portion was made anew, but the old copper wire gauze was tacked on to the end of the new machine. When this was used the green and red fog immediately disappeared. There seemed to be little doubt as to the cause of it.

We sawed the old squeezer across near the end where the copper wire gauze had been, and perceived that the wood was stained with decomposed emulsion to a depth of about an eighth of an inch from the inside surface. It is not likely that the emulsion was absorbed whilst the actual squeezing was going on. The wood might absorb the soluble salts of the emulsion, and free ammonia if there were very much of it at these times, but probably not emulsion itself. It is likely that the emulsion was absorbed during the process of washing the arrangement with hot water after using it, to wash it being of course quite necessary. The wood was not varnished, and yet it took a year to become contaminated to such an extent as to do any damage.

We believe that we could safely recommend the use of such a piece of apparatus as we have described, with this difference only, that it be thoroughly varnished with three or four coats of shellac varnish.

We have noticed the change of colour which emulsion containing free ammonia undergoes if it remains for any time in contact with copper, and have, moreover, observed that before leaving the emulsion in contact for long with the copper wire gauge, the gelatine becomes insoluble in hot water. For this reason, should emulsions made by the ammonia method be squeezed through copper wire gauze, the apparatus should be washed in hot water immediately afterwards. When an hour or so has elapsed there will

be great difficulty in washing out those small particles of emulsion which remain entangled in the meshes of the gauze.

We have seen a brawn-presser used for dividing up emulsions. This piece of apparatus is made of iron, and is simply japanned inside and outside. We believe that ordinary photographic black varnish would be found a quite sufficient coating for most metallic vessels were it desired to manipulate melted emulsions in them. Certainly those who have scruples about using unsophisticated copper wire might try the effects of giving it a coating of black varnish.

Concerning the vessel to receive the finely-divided emulsions, we may say that in our opinion nothing is better than the ordinary kitchen hair-sieve; but it must be borne in mind that this utensil being of wood, and requiring, like the squeezer, to be washed in hot water after it is used, is liable through time to become contaminated like the latter. It is not nearly so liable, however, to give up to the emulsion any contamination of which it may be the recipient, as the emulsion is never squeezed against the sides of it. Moreover, a hair-sieve is a very cheap piece of apparatus, and it is no great hardship if the plate-maker has to purchase a new one now and again.

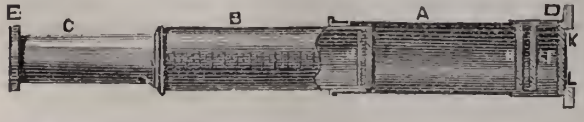
The sieve should stand in a vessel of water, and its upper edge should stand, perhaps, an inch above the outlet of the vessel; thus the emulsion is squeezed into water, and the particles are kept separate *if the water be kept cold enough*. It is necessary to use ice in winter to cool the water into which the emulsion is squeezed, otherwise it (the emulsion) will form a sloppy mass lying on the hair bottom of the sieve; water will not pass through it, and the washing will be very imperfect. If the emulsion be once squeezed into very cold water, so that the particles of it stand out distinctly from one another, comparatively warm water may be used through the rest of the washing process without any harm arising.

Mr. A. L. Henderson has devised a very neat and handy arrangement for holding a sieve whilst the emulsion is being washed. It has been already described in our columns, and has the great advantage that, being light-tight, it may, when once closed, be taken into daylight, so that it need not be an encumbrance in the dark-room.

THE SIMONOFF PHOTOMETER.

THIS instrument, which has already been briefly described in our present volume, is by no means complex in construction, and is always ready for use, while the readings are obtained directly and without calculation. It has the external form of a telescope, and is directed towards the source of light. At the end farthest from the eye are a series of diaphragms which can be shifted by the hands of the observer, and as soon as the light in the interior of the instrument is so far reduced that certain figures cannot be read, the number of the stop used is noted, and this gives the intensity of the light.

The apparatus is represented by the subjoined figure.



At the end, D, will be seen two grooves (K and L) in which slide the strip of metal containing the holes of determinate size serving as diaphragms, one of these strips being represented below.

Immediately behind the diaphragm are situated three discs of opal glass (F, G, and H), these serving to soften and diffuse the light entering the instrument; and it may be advisable, in some cases, to replace one or two of them by discs of ground glass. At one extremity of the sliding-tube, B, is fitted a transparent screen, J, on which are inscribed some figures, and the tube, C, should be so adjusted that the observer can see these figures quite distinctly; indeed, if the observer is in the habit of wearing spectacles, he should use a lens at E, corresponding to those of his spectacles.

For the use of photographers the diaphragms are marked

so as to make them indicate directly the relative times of exposure, the No. 1 stop corresponding with an exposure 1, and so with 2, 3, 4, &c., up to 36, this arrangement serving to make the apparatus very simple in working. Let us take an example. If, with a light corresponding to No. 4 on the photometer, an exposure of two seconds is required, it will be necessary to give an exposure of

$$\frac{6}{4\times 2},$$ or three seconds

if the photometer indicates 6. Or if the photometer indicates 8, the exposures will be

$$\frac{8}{4\times 2} = 4 \text{ seconds};$$

while No. 2 on the photometer will indicate an exposure of one second; and an exposure of half a second will be given if the indication of the photometer is 1. In fact, all through these numbers the unit of exposure corresponding to each degree of the photometer is half a second; and to find what is the unit of exposures corresponding to 1 on the photometer is a matter for experiment in each case. Instead of a series of fixed diaphragms, a single adjustable aperture made on the Noton principle, of two square openings sliding diagonally across each other, may be used, and, in this instance, the reading is taken from a graduated scale.

From a photographic point of view, the Simonoff photometer is subject to two important drawbacks. In the first place the actinic or photographic energy is by no means always proportionate to its intensity, and all photographers know how much a yellow cast in the atmospheric tint necessitates an altogether disproportionate increase of exposure; and, indeed, a yellowness which would scarcely affect the readings of the Simonoff instrument might be sufficient to render double or treble the normal exposure necessary. Possibly, however, the indications of the instrument for photographic purposes might be made more certain by making the diffusing screens, F, G, H, of coloured glass, so selected as to cut off those parts of the spectrum which are least active in affecting the photographic plate.

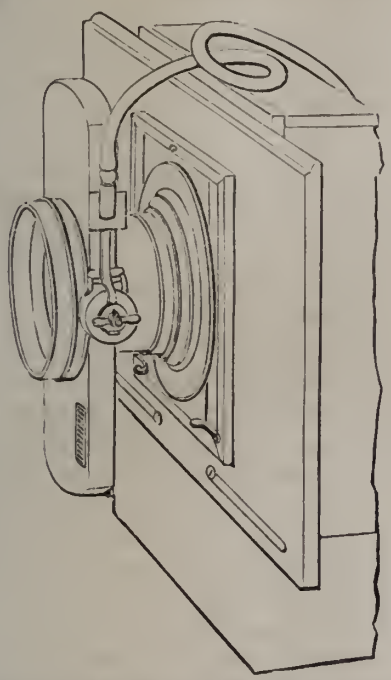
Another drawback, especially when the instrument is used in the open air, is the circumstance that the eye of the observer may not always be in the same condition of sensitiveness to light; the iris being more or less expanded according to the brilliancy of the general illumination. This latter difficulty may, however, be overcome to some extent by well shading the head during the observation, and allowing sufficient time for the eye to become accustomed to the illumination.

INSTANTANEOUS PICTURES BY DAVID AND SCOLIK.

IN a recent number of the NEWS (page 447) we referred to a series of instantaneous pictures of the Corpus Christi procession at Vienna, taken by Lieutenant David and Herr Scolik, and this week one of the series forms our supplement, while possibly another may be issued next week.

The pictures of this series were taken on plates prepared by the photographers themselves, in accordance with the older directions given by Monckhoven; that is to say, the emulsion was mixed neutral at a temperature of 50° to 60° Centigrade, after which ammonia was added,

the emulsion being next digested and washed. Iodide was present in the emulsion to the extent of about $\frac{1}{2}$ to 1 per cent., and the plates indicated 20° Warnerke. The objective used was an antiplanat of Steinheil, having an aperture of 64 mm., and a focal length of 360 mm.; while the shutter employed was that of Thury and Amey, of Geneva—the same shutter, it will be remembered, that Lugardron used for his celebrated instantaneous studies. The shutter, which is adapted to work between the lenses, is provided with a pneumatic release, and by means of a very delicately-adjusted brake arrangement the exposure, which at the quickest is $\frac{1}{2000}$th of a second, may be retarded to $\frac{1}{10}$th of a second; but the series now referred to were taken with an exposure of $\frac{1}{50}$th of a second, and the subjoined diagram shows the general appearance of the apparatus.



The internal parts consist of two sliding plates of metal which travel in contrary directions, as in the well-known shutter of Noton; but the driving arrangement consists of a pinion placed between the moving plates and gearing into two racks, one on each of the moving plates. The pinion is driven by a coiled spring.

Oxalate developer was used; but in order to produce the effect of a more prolonged exposure, the plates were immersed for some seconds in a weak solution of sodium hyposulphite ($\frac{1}{1000}$), and rinsed before development; this method of working seeming to give more details in the shadows than when no hyposulphite is used.

To return to the pictures themselves. The Corpus Christi procession is a high festival in Vienna; the Kaiser, the Crown Prince Rudolf, and the other members of the Imperial family, being in the habit of walking in the procession with uncovered heads, while horse and foot guards accompany. The "holiest" is carried by the Archbishop under a Baldichino, and immediately behind walks the Kaiser.

Lieutenant David has made an excellent series of views representing military life—soldiers with powder waggons, gun practice, and various evolutions being depicted with a wonderful realism; while Scolik has produced some fine instantaneous views on the Prater at Vienna during the month of May this year, and the active life of this favourite resort is well illustrated. An exposure equal to about $\frac{1}{50}$th of a second was ordinarily given.

AN ELECTRICAL EXHIBITION AT PHILADELPHIA.

NOT far from the spot where Benjamin Franklin drew lightning from the clouds, and satisfied himself of the identity of the grand flashings of Nature's laboratory and the tiny sparklets of his own, stands the Electrical Exhibition. Absolute novelties there are few—perhaps none—but there is a good collection of exhibits, which fairly represent the extent to which man has at present brought electricity into his service.

No awards or prizes are to be given, a feature of novelty as regards the present Exhibition; indeed, exhibition awards are not highly estimated, as a rule, especially by those who know the conditions under which awards are often made.

Official examinations and quantitative determinations as to the efficiency of the apparatus shown, will be made by a special committee, and all persons allowing quantitative tests of their machines must consent to the unconditional publication of the results.

An exceptionally large dynamo on the gramme principle, and capable of actuating no less than 2,500 incandescent lights, is shown; and it is said that many a visitor who has incautiously stood near this monster may remember it with good reason, from the fact that his watch has seemed to be under some uncanny influence ever since—sometimes going at high speed, and at other times merely crawling. Attractive to the general public is the electrical fountain, in which the streams of water are brightly illuminated by internal electric lights, as they issue from the jets, the appearance of streams of fire being produced.

Gas engines produce a large proportion of the motive force used in the Exhibition, and it is evidently the opinion of many competent judges that the gas engine is the motor of the future—at any rate, for driving dynamo-machines. Thirty-seven cubic feet per hour may be taken as the average consumption of gas per horse power; while each horse power of motive force will give a light about equal to one hundred and fifty standard candles when the incandescence system is adopted; but the return of light per h. p. amounts to 2,000 candles when small arc lights are used, or more than double this in the case of large arcs.

PHOTO-ASTRONOMY AT THE RIFFEL.

BY C. RAY WOODS.

No. IV.

POSSIBLY, by this time, many of the readers of the NEWS will have wondered why they have heard so little from me as to the work I came out here to perform. To such I may answer that my difficulties have been so many that, in spite of the promising results I got even from the first, I could not be sure that the negatives I had obtained were to be relied on, even as a partial success; that much was false I knew. It is not pleasing to find oneself in the predicament of having said anything that later work has proved to be incorrect, even if the circumstances at the time of so offending justified such a statement. Now, however, that my photographs promise some small return, in addition to proving the accuracy of the process by which they were obtained, I am able to enter more into detail than I have hitherto done.

One very important objection to the results which Dr. Huggins first produced was that the blue glass or the permanganate cell might itself be the cause of the corona-like appearances which he produced on his plates. No matter how well a surface may be polished, there is sure to be some amount of scattering of light from its surface, in addition to the reflection which is the natural accompaniment of refraction. The image of the sun being so very brilliant, all scattering of light and reflection from one surface to another must produce an appreciable effect. Dr.

Huggins, therefore, sought to do away entirely with any absorbing medium in front of the plate, and he succeeded. Why?

During the Eclipse of 1882, a plate which was exposed for three seconds only, showed the corona extending for some distance from the sun's limb, and, in addition, also reproduced the comet that caused such astonishment in the minds of the spectators. In 1883, on Caroline Island, this result was improved upon, and an exposure of only one second produced a result which, for extent, far exceeded our expectations, and showed good detail. During an eclipse, everything is favourable. There may be atmospheric glare, but such glare is due to the corona, the sun's light being cut off; one has simply to reproduce the effect not only visible to the naked eye, but reinforced by light—or to express it more correctly, by vibrations, which produce no effect on the retina. In attempting to reproduce the corona without an eclipse one has to bear in mind that there are three gradations of light to be dealt with: firstly, the light of the sun; secondly, the light from the corona *plus* atmospheric glare; thirdly, atmospheric glare alone. Now it is the second of these which has to be brought into prominence to the disparagement of the other two.

The practical photographer will bear in mind how short an exposure is required to bring out the sky, even when it is perfectly free from clouds. The exposure, for instance, is very much shorter than is required to produce a photograph of the corona during an eclipse. Taking the exposure of the average dry-shutter as one-tenth to one-eighth of a second, the sky is usually brought out *fully exposed*. It is obvious, therefore, that nothing short of what is called an "instantaneous exposure" is likely to be useful in taking the corona *plus* the light of the sky, or, in other words, *plus* the atmospheric glare. The difference between the light of corona, and the light of corona *plus* glare, is, in England at least, very slight. When two objects approach each other very closely, in the intensity of their light it is not very easy to discriminate between them. Photography, however, is better able to do this than the eye. To take a familiar illustration. Forgeries and erasures have been detected by means of photography, simply through the fact that a slight difference in texture has produced a corresponding difference in illumination; and when this slight difference in illumination has been encouraged and intensified, the fraud has been made apparent. Again, those who have made positives (I refer more particularly to lantern slides) from thin negatives must be aware that they have the power of bringing out more detail than can be obtained in a silver print, simply because, by a rapid exposure, they can just reproduce the detail, and then intensify it. Applying these examples, therefore, to the question under consideration, it *should be*, and, as Dr. Huggins has found, it *is*, possible to get the corona distinct from the atmospheric glare, and make its presence more marked by intensification. Dr. Huggins' best results were obtained by developing the plate so slowly that the action could be stopped when the corona appeared, and then intensifying it.

So far, however, one of the most important matters, the brilliancy of the sunlight, has been allowed to drop out of sight; and it certainly might be ignored altogether, did it simply stand by itself, for the bringing out the difference between corona, and corona *plus* glare, is the most important point. In photographing upon glass, however, where one portion of the film is acted on by light of greater intensity than that which acts on another portion, an action is set up by light reflected from the back of the plate, and is known as halation. In addition to this, the action of development carries the effect of reduction from one particle to other particles in its immediate neighbourhood. This latter action is not sufficient to account for the results obtained by Dr. Huggins or by myself, and has been guarded against in a way to be mentioned shortly.

The main difficulty from the first was to guard against halation, and this was done in a manner that has been mentioned in previous articles. It would appear that when asphaltum is thickly laid on the back of a plate with a spatula, all that could be done was done. But one of the objections raised against Dr. Huggins' method was, that the corona-like appearance he obtained might be due to inequalities in this asphaltum backing. I am happy to say that this point I have set at rest. By putting on the asphaltum too thinly in parts I obtained results which would not tally at all with the appearances set down to the corona; and again, when a series of photographs obtained on the same day showed the same form, it is evident enough that if they are not genuinely coronal, they must be due to some other cause than one which would vary with each plate used. It is absurd to suppose that two plates could be insufficiently backed in exactly the same manner.

It was pointed out at the time when the process was first brought forward that the results would be of greater value if the sun's image had first been cut off. I was not able to try this when first I arrived here, but on a suitable disc being sent me, I put it into requisition. It served another purpose in addition, before detailing which I must draw attention to another difficulty that arose.

It is necessary to use the shutter in front of the plate after the image has already been formed. When the shutter is placed elsewhere, the final photograph is built up of a succession of images. This matters little in landscape photography, but in solar work many errors might creep in. In photographing the sun, the shutter is placed at the focus of the first image—that formed by the object glass—and though this image is subsequently enlarged, the result is practically the same as if the shutter were close to the secondary image in front of the plate, and it is far more convenient. With such a delicate piece of work as photographing the corona, the precautions that have to be taken must be more efficient than in photographing the sun; and the shutter in front of the plate is not without its objections. I found, for instance, that my results were marred by rays which glanced off the edges of the shutter as it crossed the sun's image, and this inspired the fear that most of my corona might be due to the same cause. By carefully repainting the edges with lamp-black, however, I was able to modify this very disagreeable objection.

But when I received the disc, three difficulties vanished; possibility of insufficient backing, communication of action to surrounding particles, and defects through the shutter. The disc was larger than the sun's image, and might therefore be safely placed behind the shutter—that is to say, it was so mounted that the shutter passed between disc and plate. The results then obtained were more delicate and more trustworthy than formerly, and, in spite of the evil influence of the haze that has prevailed, may yet throw some light on the nature of the corona when a searching examination has been made of them. I cannot refrain, however, from expressing some little disappointment at not having met with any of the clear blue-black skies that up to the present year have frequently been met with at this height in Switzerland. Yet the atmosphere here is far and away superior to that which we have in England, even at the best of times. Of ærial perspective, there is none except when one glances down the valley; mountains stand out as if close at hand, and far-away peaks, taller than some at a much smaller distance, appear diminutive because the eye has nothing to guide it in estimating distance.

In this connection I cannot refrain from concluding with a story told here by a gentleman whose inventive faculties are in advance of his love of truth.

"I was coming," said he, "from St. Niklaus to Zermatt with a friend who had never been here before, and he told me that he was very much disappointed with the mountains, which did not seem so very big, after all."

"Indeed! How high do you think that peak is?" pointing to the Weisshorn.

"About a thousand feet."

"No, nearly fifteen thousand."

"We walked on," continued the narrator, "till we came to a pool of water across the road, and my friend stopped with a look of perplexity on his face."

"Why don't you jump across it?"

"No, thank you, I know better now. That puddle only looks three feet wide, but it cannot be less than forty."

A NEW DEVELOPER.

BY CARL EGLI AND ARNOLD SPILLER.

In a recent issue of the News, the fact was referred to that although the gelatino-bromide worker had a good choice of compounds for developing, only two were practically used, viz., ferrous oxalate, and pyrogallol. That the former is used abroad, while the latter is almost exclusively in vogue in this country, can be easily explained, we think, when the properties of the various developers, and the style of work carried out in the different countries, are considered.

The ferrous oxalate yields negatives of an agreeable black tone, free from stain, but generally covered with an objectionable white deposit of calcium oxalate. The films to be treated with this developer must receive approximately the correct exposure, for there is no practical means of *forcing* an under-exposed image, while the restraining of an over-exposed film is attended with a good deal of uncertainty. Pyrogallol developed negatives are of a brown tone, often dreadfully stained of a non-actinic colour; but from the nature of the developer a good deal, the exposure of the films can vary between wide limits of what is considered normal. It must be remembered that Continental photographers work with a delightfully clear and constant light, and are chiefly engaged in the studio. Thus it is much easier to determine the correct exposure; so, not being troubled with the latter difficulty, our *confrères* prefer a ferrous oxalate developed negative, with its clear, black, and unstained image.

From the foregoing it may be inferred that an ideal developer would be one capable of yielding a clear, black, wet-plate tone, free from stains and deposits, and at the same time possessing ample means for forcing and restraining. We believe that such a power is possessed by *hydroxylamine* when in the presence of an alkali.

Hydroxylamine, NH_3O, was obtained by Lossen when examining the intermediary products in the reduction of nitric acid to ammonia by means of metals. It is generally considered as ammonia in which one atom of hydrogen is replaced by the radical OH.

Ammonia	Hydroxylamine
$N\begin{cases} H \\ H \\ H \end{cases}$	$N\begin{cases} OH \\ H \\ H \end{cases}$

The process adopted for its manufacture is the same as that originally described by the discoverer, viz., the reduction of nitric ether by tin and hydrochloric acid. Hydroxylamine does not exist in the free state except in solution; but, like ammonia, it forms several permanent salts, and it is in the latter form that it will be found most useful for photographic purposes. The salt used is the hydrochloride, a substance analagous to sal-ammoniac, and already in the market. As neither the base nor its salts alone have any effect on silver bromide, it is found necessary to add a fixed alkali such as soda or potash.

For the development of gelatino-bromide plates, we recommend the following solutions:—

A.—Hydroxylamine hydrochloride...	... 32 grains
Citric acid	... 15 ,,
Potassium bromide	... 20 ,,
Water	... 1 ounce
B.—Caustic soda	... 1 dram
Water	... 1 ounce
C.—Potassium bromide	... 20 grains
Water	... 1 ounce

For a $7\frac{1}{2}$ by 5 plate the film is first soaked for about one minute in three and and a half ounces of water containing one drachm of A, about 20 drops of B is then added, and, if necessary, an extra 10 or so. Should the image show signs of over-exposure, or if the plate is one of the specially sensitive kind, a few drops of C must be used to restrain the action still more. The advantages resulting from the use of this developer are the following:—

1. The image is of a *wet-plate* tone, perfectly free from stain or deposits.
2. A great variation of exposure is permissible.
3. The solution is not acted on by the atmosphere, and therefore does not deteriorate during development from external causes.

In conclusion, we beg to state that experiments are now being carried out with a view to the application of hydroxylamine for the development of gelatino-chloride films, and gelatino-bromide paper; also for the substitution of the carbonates for the caustic alkalies.

A NEW METHOD OF PRODUCING NEGATIVES FROM ALBUMEN PRINTS.

BY W. T. WILKINSON.

Most photographers are aware of the importance of securing a transparency from any negative which is at all likely to be required for a long order, but on account of the difficulty there is usually to get a successful result upon a dry plate, or the trouble and bother of the carbon process when only used occasionally, this is usually shirked, and, may-be, the negative is subjected to the hardships and danger of printing, until at last, and long before half the order is finished, the negative is ruined, either by a crack (across the face, of course), or else by silver stains gathered from the sensitive paper.

It is now too late to get a transparency, and to make a copy in the camera will not yield the same result as the copies from the original negative; but if the plan now to be described be followed, there will be no falling-off in quality, whilst as many negatives as may be required may be secured, all being alike.

First of all, the transparency. This is furnished by selecting the deepest silver print made whilst the negative was in its pristine condition.

This print—unmounted and with a clean back—is smoothed so as to lie quite flat, when it is placed face downwards upon a piece of clean blotting-paper, and the back well rubbed with a rag saturated with olive oil until the whole of the print is evenly saturated; now clear away all superfluous oil from both back and front; finally ensuring this by warming in front of the fire, and placing between sheets of blotting-paper.

Now a word of warning: Don't, after reading this, think that waxing will be better, because it will not; a waxed silver print for this purpose will be simply useless, therefore stick to the oil.

We have now an oiled silver print, which is placed in the printing-frame *face downwards*, then surrounded by a mask or safe edge, when a piece of sensitive carbon tissue is placed in position; the frame is now closed, and exposed to light for from three to six tints.

The carbon print is developed upon a collodionised glass, and, after being dried, a print is taken from it to see if the negative is sufficiently dense; if not, a dose of a moderately strong solution of permanganate of potash will at once supply any deficiency on this score.

There are many ways in which this method of reproduction will commend itself to photographers; for instance, in cases where double printing has to be resorted to, directly a perfect print has been secured, let it be oiled, and a carbon negative or negatives made, and instead of

the trouble of double printing each and every print, the same result is got by the one printing.

Again, after being in print for some time, the pictures from a favourite negative are not so clean as the earlier ones; but with this process, as soon as a negative begins to show signs of wear, there need be no compunction in consigning it to the waste pan, as another can be made as good as new.

Those photographers who do not use the carbon process should know that a negative can be made quite as well from the oiled silver print upon a gelatino-chloride plate, using a good duplex or round wick paraffin lamp to impress the image, the only precaution needed being not to over-expose, but at the same time to get all detail out in the negative that is in the silver print.

I have tried to make a negative from the oiled silver print upon albumenized paper, but cannot get anything like a good result; there is always a want of pluck in the resulting silver print.

For the information of those not familiar with carbon manipulations, I will describe an easy and simple method of sensitizing and drying carbon tissue.

Suppose it is desired to reproduce some negatives 8½ by 6½; clean a few plates 11 by 9, and give them a final polish with French chalk; then coat with collodion (any old iodised will do), and place in clean cold water until required.

Now cut a few pieces of carbon tissue (Autotype No. 100, or Monckhoven's chocolate red), 9½ by 7½; immerse in a solution of—

Bichromate of potash ...	... 1 ounce
Water	... 20 ounces
Ammonia	... 10 drops

for three minutes.

Then remove one of the collodionised plates from the water, and immerse in the bichromate solution; place the surface of carbon tissue in contact with the collodionised surface of glass plate (taking care not to abrade the surface of collodion); adjust the tissue in the centre of plate, and lift the two from the solution. Now place a piece of American cloth over the plate, and apply the squeegee gently; remove the American cloth, and stand the plate in a rack to dry in the dark-room.

When dry, the tissue will strip off the plate with a splendid surface for getting contact with the oiled transparency.

THE INFLUENCE OF CIVILISATION UPON EYESIGHT.

BY R. BRUDENELL CARTER, F.R.C.S.

It is recorded by Humboldt that he was travelling in South America under conditions which rendered it necessary for the party to divide, and to reach their destination by different routes. As he and those who remained with him approached the appointed meeting place, he said to the Indian guide that he wondered what had become of the others. The guide looked at him with some surprise, and pointing across a wide mountain gorge, one side of which they were traversing, replied, "There they are." Humboldt himself could see nothing but rocks and verdure; but ultimately, being assisted by the guide as to the position of the other party, succeeded in discovering them by the aid of a telescope; and then, by making the guide describe the order of march and the relative positions of the several individuals, obtained proof that he actually saw them plainly with his unaided eyes. An experience of equal significance, if of less striking character, may be had in any Highland deer forest, where deer which are conspicuous to the eyes of the keeper can only be seen with difficulty and uncertainty, and after much pointing out of neighbouring landmarks, by visitors who are habitual dwellers in towns. In other words, the acuteness of sight of the average citizen is much inferior to that of the average Scotch forester; while the acuteness of sight of the forester is probably much inferior to that of the savage. People are too prone to accept this as something necessary or inevitable, and to think of the forester or the savage as the possessor of some special acuteness which has been conferred upon him by training and practice, instead of thinking of the citizen as a person who by reason of unfavourable circumstance falls short of the acuteness of vision which he ought to possess. The view thus taken is the more remarkable, since the average citizen of the better classes—say, the average member of a volunteer corps—would be fully equal to the forester or the savage in other points of physical efficiency; and the selected English citizen might be confidently expected to hold his own against any athlete in the world. In running, in jumping, in rowing, in every game which requires skill, strength, and endurance, the young urban Englishman excels; but his sight has been suffered to decline in acuteness by sheer neglect; and the conditions of his life have also produced two kinds of deformity of the eye-ball, the short-sighted eye, and the flat or hypermetropic eye, each of which constitutes a serious deterioration in the organs of the visual sense.

In order to understand the practical bearing of the subject, it is not necessary to have any minute knowledge of either optics or anatomy, but it is necessary to have a general notion of the way in which seeing is accomplished. The essential parts of the eye have their analogues in a photographic camera. They consist of a lens which produces a diminished image or picture of external objects, and of a screen on which this picture is received. In the camera, the glass lens being of invariable strength, provision for obtaining clear pictures of either near or distant objects is made by arranging that this lens may be moved nearer to or farther from the screen; but in the eye, the lens being of elastic living tissue, the same provision is made by a muscle which increases the degree of its convexity, and thus increases its optical strength. In the normal or ideal eye, with which at first we are concerned, the proportions are of such a kind that the screen receives a perfect picture of distant objects when the eye is passive, and a perfect picture of near objects when the lens is rendered more convex by its muscle. The muscle is called the muscle of accommodation, and its effect, the placing the eye in a state to see near objects acutely, is called the act of accommodation.

In the eye the screen which receives the picture is composed of a delicate layer of nerve tissue; and the perceptive portion of this layer consists of a fine mosaic, so to speak, formed by the terminations of nerve fibres. The finer the mosaic—or, in other words, the smaller the terminations of the fibres, and hence the greater the number of such terminations which fall within a given area—the greater will be the acuteness of sight. In a general way, it may be said that the size of the nerve terminations which form the mosaic bear a definite relation to the smallness of the smallest point or object which can be seen; so that a person in whom these terminations were of a given magnitude would see a smaller object than would be visible to one in whom the terminations were larger. Besides form, however, objects are rendered visible by colour; and the power to discover slight differences of tint between objects and their surroundings implies a corresponding development of the colour-sense, which appears to be a special endowment of a particular group of nerve-fibres. The importance of this endowment in relation to acuteness of vision will be perceived when it is remembered how much some animals are defended by their power to assimilate themselves to the colour of the objects amongst which they move—fish to the colour of the bed of the stream, birds and insects to the colour of foliage and other surroundings, and so forth. In the human eye, the nerve terminations upon the screen—or, as it is technically called, the retina—are of two kinds, distinguished by their shape as "rods" and "cones," and the cones are more sensitive to colour than the rods, besides possessing a more delicate susceptibility to other sensory impressions. The cones are most abundant in the central part of the retina, and are comparatively sparingly distributed over its lateral portions; with the result that vision with the central part is much more acute, both as regards form and colour, than vision with the lateral parts. The portion of the retina in which vision is most acute differs from the surrounding portions in tint and in thickness; and hence is called, almost indifferently, the "central depression," or the "yellow spot." The size of the yellow spot probably varies in different persons; but the limit of acute vision is about sufficiently large to include the width of the nail of the forefinger when the hand is held as far as possible from the eye. The image formed upon the retina by the optical apparatus of the eye is complete in all its parts, and embraces an area of about 160° from side to side, and of about 120° from above downwards; but of this comprehensive image only the small central portion is in reality actually seen. The mobility of the eye almost neutralises, so to speak, the narrowness of the field of exact vision;

insomuch that the fact of this narrowness is unknown to the majority of persons, and becomes a matter of surprise when shown by observation or experiment. In technical language, the acute vision with which we see the objects to which the gaze is directed is called direct vision; and the imperfect vision, which renders us conscious of the main outlines of lateral objects, is distinguished as indirect. The former is the function of the region of the yellow spot only, the latter of the whole of the lateral portions of the retina.

Assuming the eye to be of proper shape and proportion, the degree of acuteness of vision in the central part depends mainly upon two elements—namely, the size (or rather, the smallness) of the nerve terminations, and the acuteness of the sense of colour. There is reason to believe that a nerve termination is not stimulated or impressed by an image smaller than itself; and that therefore the finer the mosaic of the terminations, the smaller will be the images of which they can take cognizance. The influence of the colour sense needs no demonstration. A person who was colour-blind would be unable to see any indication, at a comparatively short distance, of soldiers clothed in red who were standing among foliage, or to discover ripe cherries among the leaves around them; and it is obvious that, when the colour sense is unusually acute, objects may be distinguished by its help when they would be undiscoverable by mere outline.

Not only has the acuteness of vision of civilized man fallen below the standard common among savage nations, but, at the same time, the eyes of civilized man often depart from the normal or approximately spherical formation. They depart from it in two opposite directions; either becoming flattened from front to back, so as to bring the retina too near the surface, or elongated from front to back, so as to remove the retina too far from the surface. The former condition, technically called "hypermetropia," demands the exercise of accommodation even for distant objects, thus becoming a source of fatigue to the eyes; and it is also a common cause of squint. The latter, technically called "myopia," is the cause of short sight. These two malformations may be said to have come into existence within historic time, and into prevalence almost within living memory.

Hypermetropia, or "flat-eye," may be regarded as a matter of arrested development. The eye is flat because it has not attained its fullest proportions. It is stunted, and the imperfection is seldom limited to the shape of the organ as a whole, but usually extends also to its component parts. The retina of a flat eye is commonly defective, so that vision, even when assisted by glasses which correct the fault of shape, falls short of the normal standard. It goes without saying that hypermetropia is favoured by all circumstances which interfere with complete bodily development, and that it is most common among a population living in unwholesome condition.

The original cause of myopia, on the other hand, seems to be the application of the eyes to near objects; in other words, the poring over books and handicrafts. When the eyes are directed to a near object they are turned in, or rendered convergent, so that the axis of vision meets upon it, and this position is maintained by a muscular effort which, if continued, alters the shape of the eye in the direction of elongation. Manifestly, the alteration will be most easily effected during youth, when the tissues of the body, including those of the eye, are comparatively lax and distensible, and it will also be most easily effected among those young people whose tissues are exceptionally weak, by reason of inadequate food, or of unhealthy descent or surroundings. Badly-lighted schools are the great manufactories of myopia, the bad light compelling approximation of the books or other materials of study. There is yet another defect of shape, called astigmatism, which merely means that the surface of the eye is differently curved in different directions. All three, flat-eye, myopia, and astigmatism, however produced originally, are peculiarities of shape which are constantly handed down by parents to their offspring.

An examination into the state of colour vision in England was carried out a year or two since by a committee of the Ophthalmological Society, and it was found that the percentage of defect, say among Eton boys, was decidedly smaller than in the labouring population. The same would probably hold good as regards acuteness of vision and the shape of the eye; but, at the same time, the amount of defective sight in some of the great public schools is a matter which is beginning seriously to engage the attention of masters. Unfortunately, it is often overlooked in all schools, and the children who suffer from it are liable to be treated with injustice.

The defects of shape of the eyeball, whether flatness, elongation, or astigmatism, may to a greater or less extent be corrected by optical appliances, and when so corrected the mischief which the defects produce may almost be said to be limited to the trouble and cost incidental to procuring and using such appliances. For sub-normal vision, which is independent of faulty shape, optical appliances can do nothing, but a remedy may sometimes be found in diligent exercise of the defective organs. The question remains whether a civilised community should acquiesce in the prevalence of sub-normal vision, and in the increase and perpetuation, as well as in the prevalence, of defective shapes of the eyeball, without any effort to bring about a better state of things? I think not; and I think also that the first step towards improvement must be the recognition of the nature and extent of the evil.

Is there any reason why perfection of sight should not be made a point of physical excellence in all athletic contests? The example might be fitly set by the Volunteers, who might thereafter in time diminish the diameters of the bull's-eyes of their targets; and it would soon be followed by public schools and by athletic clubs. The tests would be easy of application, the value and uses of superiority would be unquestionable. A first effect would be to make people understand what they ought to be able to see, and a powerful counteracting influence would be brought to bear against those conditions which at present render it difficult for the dwellers in large towns ever to look at a distant object. Important good results would not be immediate, nor could they be fully attained except in more than one generation; but I think it cannot be doubted that they would ultimately follow.

Notes.

The opening or Exhibition soirée of the Photographic Society, which takes place to-morrow week, is to be accompanied by a total eclipse of the moon: first contact at 8·15, commencement of totality at 9·16, end of totality at 10·48, last contact with the shadow at 11·49.

One may predict that the Photographic Exhibition of this year will not be below the average, probably above it, as the pictures are in reality a selection from a much larger number than it would be possible to place, and the average of the whole seems quite up to the standard.

We have frequently alluded to the photo-micrographical researches of the recently deceased Dr. J. J. Woodward, of the United States army; and, indeed, this distinguished investigator has done much towards securing a general recognition of the importance of photography as an aid to medical science. Dr. Noriss's photographic observations, which lead him to believe in the existence of a third kind of corpuscle—practically invisible to the eye—indicate a direction in which much work may be done.

Photography is made good use of at Scotland Yard, under the directorate of Mr. J. Monro, the Assistant Commissioner of the Metropolitan Police. Attached to a circular dated the 8th instant, we find a Woodburytype print 6 by 4½, on which are closely grouped together the heads of thirty-six well-known offenders who are now wanted, each portrait having a reference number impressed; while the body of the circular gives a carefully tabulated previous history of the thirty-six, and such clues to their probable whereabouts as may be gathered from past records.

"Don't do that any longer, but purchase one of my posing chairs!" says a New-Jersey advertiser; and the

portraitist who cannot make the above burlesque representation of the too-much-rested sitter furnish him with a hint must be dull indeed.

From the bad to the good is a desirable transition; so let us glance at a well-designed posing chair made on the other side of the Atlantic (De Voe, Springfield, Ohio). The general frame-work is of cast iron, and numerous alterations can be made in a few seconds, as, for example, by changing the seat, removing the foot-stool, or putting

a back and arms in place of the body rest. The cast-iron framing need cost but very little, and photographers could then purchase the interchangeable extras as required. What British manufacturer will be enterprising enough to put something of this kind on the English market?

It would be interesting to have more exact information about that wonderful photograph, which report states was taken by a son of Mr. Rowland Winn, from the roof of Nostell Priory during the recent Franchise demonstration. If it is indeed possible, as rumour further asserts, to count 100,000 heads in this sensational picture, practical photographers would very much like to know "how it is done." A negative that thus appreciably helps the political statesman ought to be widely proclaimed from the house-top, on which it was taken. Young Mr. Winn's success suggests, indeed, a very simple way in which even the census can be "taken by photography" in future.

But, as we have said, a few additional details would be very welcome, and a "demonstration"—mathematical rather than political—of how the "heads of the people" are thus comprehensively numbered. Meanwhile sceptical critics will not be content with what may be called the *a priori*, or rather "Nostell Priory," line of argument.

Among the evils which Mr. Cocking attributes to inhaling the fumes of ammonia, may be mentioned severe catarrh and deafness!

That an edging of varnish—effectual enough in securing a collodion film to the glass plate—should be useless when applied to a gelatine film, is to be expected, for the gelatine swells and breaks up the varnish; while the varnish penetrates a collodion film and prevents it being wetted. "Merely paint the border of the gelatine plate with a saturated solution of chrome alum," says Mr. Sebastian Davis, "and the film will never frill from the edges.

How much chrome alum is it well to add to an emulsion? Here, again, we quote Mr. Davis: "Less than one-eighth of a grain to the ounce is seldom much use, and more than a quarter of a grain generally serves to make the gelatine too insoluble for easy re-melting; but of course something depends on the quality of the gelatine itself."

Truth calls attention to a singular decree on the part of the Watch Committee of the borough of Portsmouth. According to this decree, all the police inspectors, sergeants, and constables had to march down to a local photographer's, where each man had his likeness taken in a set attitude with his helmet beside him. The good people of Portsmouth have been much puzzled to know what this means, and *Truth* unkindly, and it may be untruthfully, suggests that the photographer in question has valuable influence on the Watch Committee, or that there is a surplus of the borough rates which the Corporation are anxious to dispose of quietly. There is also another theory which we are surprised has escaped our quick-witted contemporary. As our thieves are photographed for the benefit of the police, why should not the police be photographed for the benefit of the thieves? The thieves would certainly appreciate this little act of attention, especially in the case of detectives and plain-clothes men.

New developers for gelatine bromide plates may be multiplied almost indefinitely, as almost any sufficiently powerful reducing reagent which can act in a neutral or alkaline solution may be made to bring out the latent image; but, if we mistake not, the hydroxylamine developer of Egli and Spiller, described on page 613, will be found to possess notable advantages. Although the hydrochlorate of hydroxylamine now costs about ten shillings an ounce, there is every reason to suppose it can be manufactured at a low price, should a demand for it arise. It seems that the most promising and easiest mode of preparation known at present is by the action of sulphuric acid on nitromethane, and if it should be possible to use chloro-picrin (trichlor-nitro-methane) instead, hydroxylamine should become cheap, as chloro-picrin can be made very easily, and at a small cost.

Photographs of an instalment of the National Gallery pictures, presumably the outcome of the iron excrescence, are now to be seen in the London shop windows. The work in many instances, no doubt, was extremely difficult, but, taken as a whole, the specimens exhibited are not of supreme excellence. The colours of some of the pictures appear to have been very unfavourable for photographic reproduction, notably a picture by Grwze, which is now reproduced with every marking and imperfection, and really presents a mass of scratches and smudges.

Is there a duty on photographs of works of art when admitted to the United States? A correspondent who wishes to export a considerable number is anxious to be certain on the point. Perhaps some reader can tell him. So far as pictures are concerned, the duty is enormously high, so much so that, to avoid the payment of the tax, some Americans made a proposition to Mr. Herkomer, that instead of sitting to him here, he should go over to America, where they would guarantee him a profitable engagement. The offer was accepted, and last year the artist went over to the States, and was at work there several months. As Mr. Herkomer's prices are high, and as the duty amounts to nearly a third of the value, the shrewd sitters saved considerably.

Balloon photography is becoming a distinct branch of the profession. The Balloon Society in connection with L'Academie d'Aerostation Meteorologique of Paris intend next year to hold an exhibition in London, and at which a special exhibit will be apparatus for balloon photography.

If rumour is reliable, a well-known "professional beauty" celebrated last week the taking of her thousand and first photograph by a private entertainment to a few chosen friends. One of the chief subjects of conversation was a screen, on which had been most artistically arranged a copy of each of the thousand and one photographic portraits.

By noting the thermic results obtained with his sun motor (see present volume, page 19), Captain Ericsson has come to the conclusion that the heat of the solar surface cannot be less than 3,060,727° Fahrenheit; and it may be mentioned that the highest temperatures which have been yet realized in the laboratory are so trifling, as compared with this, as in no measure to support the mind in attempting to grasp the idea of such a degree of heat. There appears to be no reason to doubt the general accuracy of Captain Ericsson's conclusions.

Some illustrated "Hints on Posing, and the Management of the Sitter," will shortly appear as a series of ten or twelve papers. To mention that these will come from the pen and the pencil of Mr. H. P. Robinson is to say the utmost in praise of them.

"If you have occasion to look much at incandescent electric lights, you had best wear blue spectacles." This is the advice of Dr. W. H. Stone to Electrical Engineers, as he finds that the excess of the red rays in the light referred to injures the eyes; but when the arc light is concerned, this order of things is reversed, the violet rays being in excess. Here again we have conditions bad for the eyesight, so red side glasses or blinkers are provided on Dr. Stone's blue spectacles, and when the wearer has to work with the arc light, he simply turns these red glasses round so that they fold over the blue front glasses. Through the joint media it is said that the arc light may be looked at with safety.

The dark room window having been allowed a short period of rest after the recent discussions, we may mention that Obernetter colours a two per cent. collodion with turmeric and Jalap resin, and pours this on plain glass. Another way of making a medium is to make up a mixture of gelatine and turmeric, and to coat glass with it. The above are recommended for use with Vogel's azaline plates.

To accurately map out the very small stars by the aid of the eye and hand has proved to be only a step from the impossible; but M. Mouchez, of the Paris Observatory, finds photography to satisfactorily solve the difficulty. Now, in the course of an hour, an accurate map covering an area of 2° by 3°, and including all the stars of the twelfth magnitude, is obtained. To produce a chart covering the same area, on the old system required many months' hard work. An objective six inches in diameter, and having a focal length of eighty inches, is used.

Patent Intelligence.

Applications for Letters Patent.

12,482. Ernest Daniel Adcock, 53, Chancery Lane, London, W.C., for "An improved vignetting apparatus for photographic printing frames."—Dated 16th September, 1884.

Patent Sealed.

7678. Abel McDonald, Penrith, and Thomas Williamson Kendall, Cockermouth, both in Cumberland, Photographers, for "Improvements in apparatus for washing unmounted photographs and the like."—Dated 14th May, 1884.

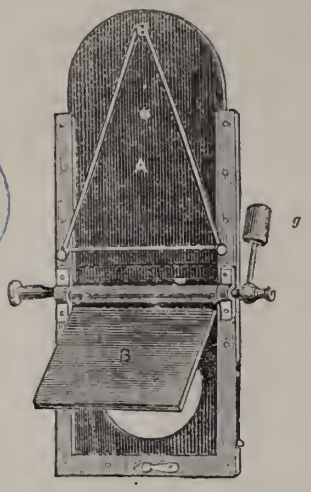
Specification Published during the Week.

2767. Frederick Woodward Branson, of Leeds, in the County of York, Pharmaceutical Chemist, for "Improvements in photographic shutters."

My invention has reference to improvements in photographic shutters, for which Letters Patent were granted to Richard Reynolds and myself dated 2nd April, 1883, No. 1650. According to my present invention, on the end of the spindle which carries the flap I mount a lever, having thereon a suitable adjustable weight; by altering the position of the weight upon the lever the flap may be actuated at different velocities, and the time of exposure be thereby varied. The lever may be moved and fixed at any desired angle or position on the flap spindle, so that it may be applied in some cases for opening the flap to allow the drop to fall; or, when required, by throwing the lever over to the opposite side of the centre of the flap spindle, and fixing it there to retain the flap closed, until it is raised by a movement imparted to the flap spindle by the attendant. Instead of the weight being placed on the adjustable lever, in some cases it may be found preferable to attach a cord or its equivalent to such lever at any suitable point; such cord or its equivalent being passed over a pulley on the upper part of the shutter, the required weight being suspended to the other end. Other parts of the photographic shutter are similar to those described in the specification of the above-named Letters Patent.

The claiming clauses are as follows:—

1. The arrangement and application of the lever, having thereon the adjustable weight *g*, and attached to the spindle, substantially as and for purposes herein set forth.



PATENT OFFICE LIBRARY

2. The general arrangement and combination of the various parts forming my improved photographic shutter, substantially as herein described.

HOW TO PHOTOGRAPH MICROSCOPIC OBJECTS.

BY I. H. JENNINGS.

LESSON 6.—DEFECTS IN THE NEGATIVE.

As the defects in photo-micrographic negatives are very numerous, it may be well to mention the chief, and their remedies, when such exist.

1. *Unequal Illumination.*—This is very apt to occur when using very oblique light, but may happen also with central light, from improper arrangement of condensers, &c. This defect may be known by the negative being dense on one side of the plate, and thin on the other. Do not blame the plate maker for improperly levelling his plates; this defect sometimes occurs, but very rarely. If the difference of density on each side is not very marked, it may be remedied by using matt varnish on the thin side of the plate, to diffuse the light when printing. Adding a little yellow dye to the varnish often improves the result, but in all cases the rough edge of the varnish should be softened by the use of a little alcohol or ether, or a nasty mark will be left on the print, just under the boundary line of the varnish.

2. *Too Powerful Illumination.*—In this case the object is "drowned in light," and the picture comes out flat and degraded. Remedy: take another negative.

3. *Reflection from the Apparatus.*—When the tube of the microscope is not lined with cloth or velvet, a bright central spot may often be seen on the screen while focussing, and a corresponding black patch will be found on the negative, which will be worthless. When using the eye-piece, this defect will not be met with. Reflection from the camera will also ruin the negative, also using the eye-piece without the cap. Let the inside of the camera and microscope tube be a dead black.

4. *Access of Stray Light to the Plate.*—Probably through the connection of camera and microscope not being light-tight. Result—general fog. Use a thick black velvet hood to connect the microscope with the camera, and keep it in place with elastic bands.

5. *Green Fog.*—This may arise from the use of impure sodic sulphite, or, in the plain pyro developer, from using too much ammonia. Green fog appears to be a silver deposit, from the fact that certain silver solvents get rid of it at once. Bichromate of potash, or peroxide of hydrogen, may be used, but the writer recommends the following, which is given by Mr. Howard Farmer in the YEAR-BOOK or 1884:—

A.—Potassium ferricyanide	...	1 ounce
Water	...	20 ounces
B.—Sodium hyposulphite ...	...	1 ounce
Water	...	20 ounces

First wet the negative if it has been dried. Pour a little of the hypo solution in a cup, and add a few drops of the ferricyanide solution. Dip a plug of cotton-wool in this mixture, and sponge the negative rapidly with it; then plunge it in water, and wash well. All trace of green fog will have disappeared.

6. *Over-exposure.*—This should be controlled in the development. After-intensification rarely produces even tolerable negatives from over-exposed plates. If much over-exposed, don't waste time in trying to patch up the negative, but expose another plate.

7. *Under-exposure.*—There is no cure for this evil: destroy the negative and take another.

8. *Under-development.*—An under-developed plate is useless. Don't hurry the development, but be sure all possible detail has been worked out, and examine the negative for density before the lamp.

9. *Thinness.*—The negative appears fully exposed and developed, but is too thin to give good prints. In this case try the effect of covering the back with matt-varnish, and print in the shade. Never intensify a negative before trying how it will print. Many a negative that appears too thin will give perfect prints. The negative from which the accompanying illustration of "Palpi of Male Spider" was taken furnishes a good example of this. This negative

PALPI OF MALE GARDEN SPIDER.

appears a mere "ghost," but prints well and strongly. Had it been intensified it would probably have been ruined. If the matt-varnish does not mend matters, the negative must be intensified. There is a choice of intensifiers, but the mercury and silver intensifiers are most generally used. The mercury intensifier is made as follows:—

A.—Saturated solution of mercuric chloride.

B.—Liquor ammoniæ ... ... 10 drops per oz.

After soaking the negative in water, it is placed in the bichloride solution until it becomes uniformly white. If requiring only slight intensification, it must be left in only a few seconds, or it will become too dense. Then wash well for five minutes, when the negative must be placed in B, which will turn the plate to a dark colour. With a little experience, this intensifier will be found very useful, but all intensification should be avoided if possible. Look for good results to the development alone, and let intensification be merely a last resource.

Other intensifiers are potassium sulphide and ammonium sulphide; either salt may be made up to the strength of 1 drachm to 20 ounces of water.

One of the best silver intensifiers is that given by Mr. W. Brooks, and is as follows:—"After the plate has been well washed from the hypo, place it in a weak solution of alum and citric acid solution:—

Stock Solution.

Saturated solution of alum	... 10 ounces
Citric acid	... 1 ounce

For the solution above named, I dilute one part to four of water, allow the plate to remain in it about five or six minutes; in the meantime, place in a developing cup about (say for a small plate) two drachms of the stock solution of alum and citric, and place in it about four grains of pyro; when dissolved, add a few drops of about a twenty-grain nitrate of silver solution."

This solution is to be applied to the plate until sufficient density be obtained; when the plate is washed, it is placed in the hypo bath for a few minutes, again washed, and finally treated with alum and citric acid solution to clear it. Plates thus intensified should not first be dried.

10. *Too Great Density.*—This is more frequently met with when using the plain pyro developer. Perhaps the simplest agent for removing it is Mr. Howard Farmer's ferri-cyanide reducer given above in speaking of green fog. The plate, if dry, is soaked in water for a few minutes, then placed in the solution, and examined from time to time until sufficiently thin. Only a few drops of ferri-cyanide must be added, or the action will be too rapid. Then wash well in running water, and dry.

11. *Shrinking of the Gelatine.*—This may arise from the gelatine being too soft, or from heat being employed to hasten the drying, which is a great mistake. The shrinking may be slight, spoiling the fine microscopic detail, or may amount to actual distortion of the image. Either way, the negative is ruined; the photo-micrographer is therfore advised to use only plates prepared with hard gelatine. Since the use of the alum bath has become more general, frilling is not so common as formerly, and the photo-micrographer need hardly be cautioned against it. Still, to avoid this, as well as the more serious evil of shrinking of the film, any plates found to be prepared with soft gelatine should be rejected for microscopic work.

Practical Papers for Beginners.

No. 10.—MAKING AN ENLARGEMENT.

How best to make an enlargement is one of those points which may be discussed again and again without any conclusion being arrived at, and the by-stander who listens to the arguments, and sees the specimens shown, may be excused if he comes to the conclusion that there is no best method; but that any person who excels in one particular method is very apt to conclude that his own way of working is indubitably the best. Simplicity and ease of working is a matter of special consideration for the beginner, and we will therefore choose for him, and describe how to make enlargements on paper with a gelatino-bromide emulsion similar to that used for the negative plates.

Now-a-days excellent gelatino-bromide paper can be obtained commercially, and we are inclined to think that the beginner will often do well to obtain it ready made; but, notwithstanding this, it is well to give directions for preparing it.

A good quality of paper is desirable, moderately stout Saxe or Rives being most suitable; but in order to fill in the inequalities of the paper, and to keep the picture well to the surface, a preliminary coating or substratum is required, and if this substratum is made partially opaque by means of a white pigment, the clearness and brilliancy of the pictures are much greater than otherwise would be. A suitable substratum or enamel is made as follows:—

No. 1.—Nitrate of barium ...	... 3 ounces
Hot water	... 1 pint
No. 2.—Sulphate of soda ...	... 4 ounces
Hot water	... 1 pint

Filter the above solutions through closely-woven muslin, and mix them, after which the deposit which forms must be allowed to settle down, and the clear liquor is poured off as closely as possible. Sufficient hot water is now added to fill up the vessel, and the precipitate or deposit is again allowed to settle down. This process of washing the precipitate should be repeated five or six times, and then the liquor containing the precipitate should be adjusted (by pouring off more or less of the water) to thirty fluid ounces, and four ounces of white gelatine are added, sufficient heat being applied to ensure its solution. When all is dissolved and the preparation is uniformly mixed, a solution of fifteen grains of chrome alum in an ounce of water is stirred in, and a quarter of an ounce of glacial acetic acid is added.

To coat paper with this preparation, the sheets are moistened, and one having been laid quite level on a slab of plate glass of corresponding size, the edges of the paper are secured by means of a bordering of thin slips of wood, laid frame-fashion on the edges of the sheet, and held in position with American clips. We thus obtain a kind of paper-bottomed dish, into which some of the enamel composition is poured, and the excess having been rapidly drained off, the glass is allowed to remain in a horizontal position until the gelatine is set—this generally happening in about half-a-minute or so—then the sheet is removed, and hung up to dry.

The emulsion is applied over the enamel in precisely the same way as the preliminary coating was applied, the sheets of enamelled paper being damped and clamped down to the glass just as already described; only it is not advisable to use an extremely sensitive emulsion like that referred to in the last lesson; a preparation well adapted for coating paper being made by the following formula, it being understood that the beginner has mastered the general details of emulsion making by carrying into practice the directions contained in our previous lesson:—

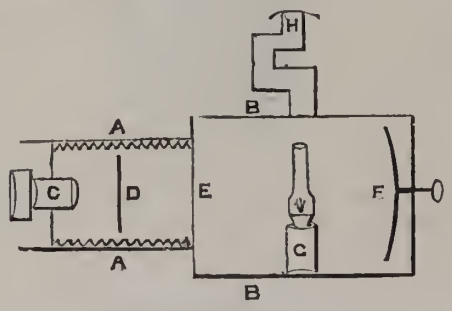
A.—Nitrate of silver	... 100 grains
Distilled water	... 2 ounces
B.—Bromide potassium ...	... 85 grains
Gelatine (as previously used)	... 20 ,,
Distilled water	... 1½ ounces
Hydrochloric acid ...	... 1 drop
C.—Iodide potassium... ...	... 8 grains
Distilled water	... ½ ounce

A and B are heated to 140° Fahrenheit, and A is gradually added to B with constant agitation. C is next stirred in, and finally 120 grains gelatine, which has been soaked in water until it has become quite soft, is added. When the whole is thoroughly melted and incorporated, it is poured out to set, and cut up into strips about a quarter of an inch square, the handle of a silver spoon being used for this purpose. These strips are washed by being soaked in some four or five changes of water, allowing (say) half-an-hour each time; but too much washing is not to be recommended in the present instance.

For drying the paper which has been coated with sensi-

tive emulsion, a tolerably warm room, from which every trace of light has been excluded, is best, and unless conditions are very unfavourable indeed, one may depend on the material drying in the course of four or five hours. As a means of enlarging, some form of magic lantern is to be recommended, and but little special instruction need be given. The negative is placed in the carrier of the lantern, and the image is adjusted as to size and focus on a sheet of white paper attached to the wall. The adjustments being completed, one caps the lens and pins up a sheet of the sensitive paper so that it occupies the required position, when the exposure is made by removing the cap. A preliminary trial as to exposure is easily made by exposing a small strip of the paper, and developing.

It is by no means essential to make use of an expensively constructed lantern with complex adjustments, and a careful worker may obtain excellent results with such a lantern as is represented below.



BUTINET'S ENLARGING LANTERN.
A, camera-front; B, tin case; C, lens; D, support for negatives; E, ground glass or diffusing screen; F, silvered reflector; G, paraffin lamp; H, chimney.

To make an apparatus like that represented above is a very easy affair, especially if the aid of a tinman be invoked. The camera originally used may slide into the front extension of the apparatus; and, as a general rule, it may be considered that the lens originally used to take a picture is a convenient one to employ for enlarging it. If one thickness of ground glass does not diffuse the light sufficiently, another may be placed at some little distance from it; or in other cases it may be well to place a piece of fluted plate glass on the lamp side of the ground glass screen.

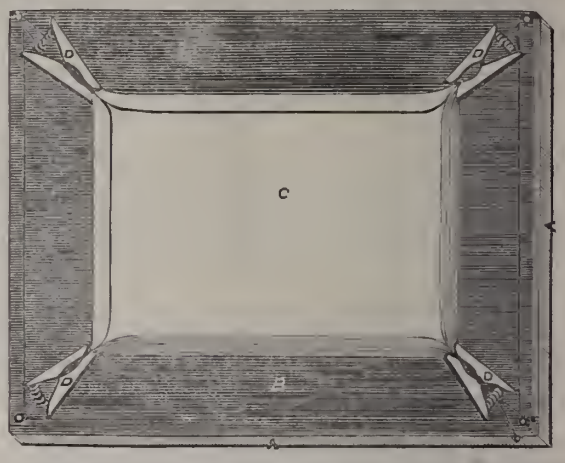
Should any difficulty be experienced in keeping the gelatino-bromide paper sufficiently flat during the exposure, it may be exposed in a printing-frame; the same frame, or a similar one, being used to contain the white sheet upon which the image is focussed.

A form of lantern very similar in general features to that above represented is shown, the main difference being that a condenser is provided, this serving to ensure a more complete illumination of the negative; and we may mention that those lanterns sold as the "Sciopticon Model," and constructed in the main as represented, are generally well adapted for making enlargements on gelatino-bromide paper.

Excellent results may be obtained with the developing solution already recommended (page 532), the paper being treated just as the glass plate was treated; but some persons prefer the ferrous oxalate developer for paper prints, and we therefore give the following directions:—

Prepare a saturated solution of protosulphate of iron by putting some of the crystals along with water in a bottle, and agitating occasionally, adding more crystals until a portion remains undissolved; and in a similar way prepare a saturated solution of potassium oxalate. One part of the iron solution and four parts of the oxalate solution, with the addition of one-fifth of a grain of bromide of potassium to each ounce of the mixed liquids, will be a good working proportion for the iron developer; and as the exact exposure may always be determined by means of trial strips, one need not vary the composition of the developing fluid. After development, the prints should be washed for a few minutes, and then allowed to remain for ten minutes in a fixing bath similar to that used for ordinary prints on albumenized paper (one and five). The final series of washings intended to remove the hyposulphite should be thoroughly performed (see p. 551).

In working with large sheets of paper it is a great convenience to be able to extemporise a large dish, and this is quite easy if a sheet of stout brown paper be waterproofed by the application of boiled linseed oil, and



allowed to dry; the sheet being then laid on a board and the corners held together by American clips, as shown above.

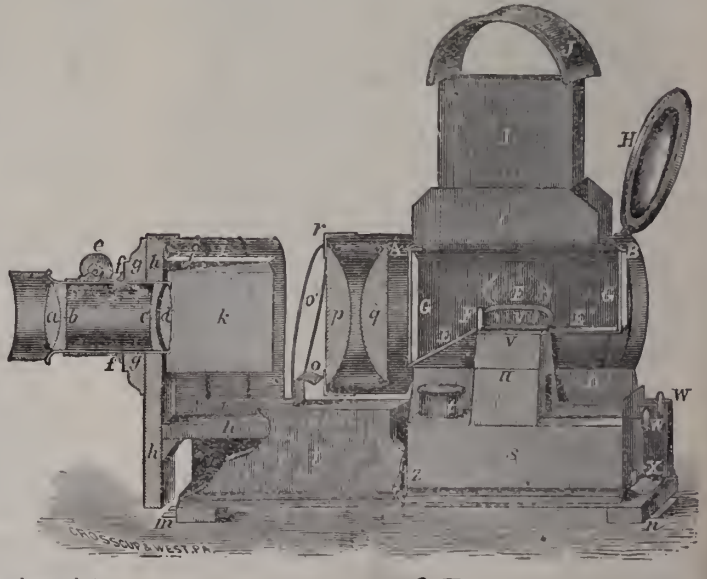


PHOTO-LITHOGRAPHY AND PHOTO-ZINCOGRAPHY.

BY MAJOR J. WATERHOUSE, B.S.C.,
Assistant Surveyor-General of India.

CHAPTER XVII.—MISCELLANEOUS PROCESSES.

WE now come to the consideration of sundry photo-lithographic processes which have been introduced from time to time, but do not come within the categories of the transfer and direct methods already described.

They may be divided under the following heads :—

1. Processes based on the uses of metallic salts other than those of chromium.
2. Oleate Processes.
3. Dusting Processes.
4. Other Processes.

1. *Processes based on the use of silver, iron, and other metallic salts.*—The earliest of these processes is Halleur's. According to Martin, he covered a thin grained stone with a strongish but perfectly neutral solution of sesqui-oxalate of iron, and by repeated washings with the solution, caused it to penetrate tolerably deeply into the stone. The stone was exposed in the camera, not wet, but just moist. The image produced appears in dull brown, and is immediately and perfectly fixed by washing over with a solution of carbonate of ammonia. A good washing with water removes all the salts, after which the stone is slightly etched with a weak solution of oxalic acid, and rolled up with printing ink as usual. The process never seems to have come into practical use.

Jobard, of Brussels, who claims to have been the first to invent a process of photo-lithography, covered a stone or zinc plate with iodine, and exposed it to the sun. Then, instead of treating it with mercury to develop the image, he covered it with a thick solution of gum-arabic blackened with lampblack, protecting it from the light until the coating of gum was dry. The stone was then plunged into water to wash away and dissolve the gum. It was then placed in the press, and rolled up with ink, which took only on the parts of the stone or plate where the iodide had not been decomposed by light. The whites remained quite pure, and perfect proofs could be obtained ; but the operation was a delicate one, and required some skill. The main point seems to have been in charging the roller very slightly with ink.

A somewhat similar process was brought forward by Messrs. Salmon and Garnier, who exposed a brass plate to the fumes of iodine, exposed to light under a photographic cliché, then applied mercury with a tuft of cotton, the mercury attaching itself only to the parts protected from the light. Ink was now applied with a lithographic roller, and attached itself only to the parts where the light acted, left untouched by the mercury. If a positive cliché were used, an image was obtained which could be bitten by acids ; if a negative, the image could be printed from in the lithographic press. This process also seems never to have come into any practical use.

Mr. Joseph Lewis, of Dublin, has described (NEWS, vol. vii.) several ingenious methods of obtaining photo-lithographic transfers with resists in silver, produced by modifications of the Daguerreotype and wet collodion processes.

In his first process he coated the surface of a card with hard plate ink, brushed it over with very fine pure silver powder, and then passed the card through a press on a highly polished steel plate. The picture was produced by the ordinary Daguerreotype process just as with a silver plate. It was then etched by the galvanic influence, which dissolved away the shadows, consisting of pure silver, and exposed the transfer ink in deep contrast with the mercurial deposit forming the lights of the image. It was then treated with a solution of cyanide of potassium, washed and dried, and then laid face downwards on a clean heated lithographic stone or metal plate, and passed through the press. The ink in the exposed parts attached itself to the stone or plate, while in the lights the film of undissolved silver and mercury prevented the ink from coming into contact with the stone. The images so produced are said to be sharp, and to stand printing very well.

In a second process Mr. Lewis treated an unvarnished collodion negative with acid and alcohol, and transferred the film to the surface of a card inked as before with greasy transfer ink. The card was then treated with ether and alcohol to dissolve off the collodion covering the shadows of the picture, thereby exposing the greasy ink surface, which may be at once transferred to stone or zinc by pressure. The difficulty in this method is to dissolve the collodion film off properly—some samples dissolving easily, others not at all, or with great difficulty.

In a third process Mr. Lewis formed upon the surface of a collodion negative a thick deposit of the mercurial salt and oxide used in intensifying, choosing for this purpose a collodion suitable for giving an image entirely upon the surface, and easily wiped off it. By pressing the inked card upon such a film the image is taken up as a dusty deposit, which prevents the ink from penetrating the stone when passed through the press. A very delicate transfer can be obtained in this way, but care is necessary to avoid stripping the collodion film along with the dusty deposit.

In a fourth process Mr. Lewis dispensed with the collodion film by precipitating a layer of chloride and iodide of silver on a glass plate. Before the plates were completely dry, a mixture of dextrine, glycerine, and nitrate of silver was applied to them. When dry, they were exposed under a positive, and when properly fixed, the deposit could be applied to the ink card and transferred as before.

In 1867, M. Morvan took out a patent for a process in which permanganate of potash was the sensitive agent. He dipped Saxe or Rive paper into a bath of sour milk, lactine, or whey, and allowed it to dry. It was then coated with a preparation made by dissolving half-a-pound of French gelatine or glue in a pint of water, and adding to it a solution of 160 grains of permanganate of potash in a quart of water. This was allowed to cool, and was then ready to coat the paper, which was allowed to dry in the dark. After exposure under a negative it was coated on the prepared side very evenly with a composition made by dissolving equal parts of bitumen, white wax, and Burgundy pitch in oil of lavender. The proof was then placed, coated side upwards, in a dish of cold water, which dissolved the permanganate in those parts not acted on by light, taking with it the coating of bitumen, &c. The proof was cleaned with a few strokes of the sponge, and was then ready for transfer to zinc or stone in the ordinary manner. M. Morvan claims for this process that it gives sharper results than the ordinary processes with bichromate and transfer ink.

(To be continued.)

PHOTOGRAPHING A TIGER ATTACKING HIS PREY.

THE *Daily Telegraph*, in a leader published yesterday, describes the photographing of a tiger in the act of attacking his prey ; but the following is the original account as given by a correspondent of the *Madras Mail*, who writes:—"So far as I can ascertain, a photograph of a tiger in the act of striking down a large animal was never taken until last week, when I secured a negative of a tiger killing a buffalo. I had focussed on the buffalo, which was tied to the stump of a tree in the middle of a field, and had just put a dry plate into the camera, when the tiger came up and struck down the buffalo with a single blow of his paw. My camera was not ten yards from the buffalo, and the tiger might just as well have come at me if he had chosen to do so, but fortunately he selected the buffalo instead, and then I took advantage of my position, and released the spring shutter just as he had given the buffalo his knock-down blow. The negative, I am sorry to say, is not a good one, but it is nevertheless interesting, because it throws some light on that vexed question—"How does a tiger kill his prey?" In the picture, which I have before me as I write, the tiger is seen standing on his hind legs, which are bent ; his body is inclined to the ground at an angle of about 45° ; his tail is straight, except the tip, which is curled upwards, and the right fore-paw is seen above, and the left below, the buffalo's neck. The head of the buffalo covers the shoulders and heart of the tiger, whose head appears above his horns ; his back is nearly level, but his front legs are doubled up under him, and he is just in the act of falling. The head is drooping and lifeless, and the whole appearance of the buffalo tends to confirm the generally accepted opinion that the tiger, with his knock-down blow, dislocates the neck of his victim.

"Lest any of your readers should be sceptical regarding the genuineness of the photograph, and also to prevent any rival running unnecessary risk when endeavouring to take a tiger in a similar position, I should explain that the tiger I photographed was not altogether a wild tiger, though he was quite loose and free at the time the picture was taken. A few days before, I had been told that a tiger was being led about by some Mahommedans, and had killed a buffalo that had been provided for it near Guntakal. I at once said that I was willing to offer another buffalo in the cause of science, and I took an early opportunity of bringing down my camera. The buffalo was tied to a stump in the open field by a rope, about twenty feet long, fastened to one hind leg. It was brought to the west side of the stump as far as the rope would allow it to go, and I took up my position with the camera about seven or eight yards to the north. The tiger was then led up to the west side of the field, and, when opposite the buffalo, was turned towards it. The buffalo, on seeing him, did not attempt to turn, or back away the dozen yards the heel rope would have allowed, but simply stood and looked at the tiger, apparently fascinated by him, as he approached. At that time there were three ropes to the collar round the tiger's neck, and a man holding each rope. When they came to within about fifty yards of the buffalo, one rope was slipped off, and soon after, the tiger, having by that time fixed his eyes on his prey, the other two ropes were let go, and he was perfectly free. It was an exciting moment for all concerned, including the photographer. The tiger came on, walking slowly, not crouching. When within two or three yards, he paused for an instant, then made one spring and gave a pat to the buffalo's neck with its right paw. Immediately after this I touched the trigger of my spring shutter, and in one-twentieth part of a second got the picture I have already described. As the buffalo fell, the tiger put his head over its neck, slipped his mouth down to his throat, and then lay across it, sucking its life-blood. As I was changing the slide for another picture, one of the Mahommedans with the tiger asked to be allowed to "Hala" the buffalo; unless this ceremony was performed, they would have been unable to eat any of the flesh. On getting permission he went behind the buffalo, which was lying on its side with its feet towards the camera, and struck his knife into its throat just above the place where the tiger had its hold. The tiger did not snarl or show any sign of annoyance; but it seemed a risky thing for a man to put his hand so near a tiger's mouth when the beast was excited with the taste of blood.

"I took some other photographs as the tiger was lying on the carcase of the buffalo; these have come out clearly, but do not possess much scientific interest. After some time the men drew away the tiger with a rope, but by that time he had eaten as much as he wanted, and was not unwilling to go. The men stated that they got him as a cub, and had had him for seven years. He was a very fine specimen, and the ease with which he knocked down the buffalo, and afterwards lifted the carcase and dragged it about, gave me an impression of his strength which will not easily fade from my memory."

Correspondence.

FELLOWS OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

DEAR SIR,—As anyone, by payment of a certain fee, can become a member of the above Society, it is a question whether it is not desirable that some distinction should be made between ordinary members, and masters, in the art of photography. I therefore humbly suggest as a plan, that all the recipients of medals at the annual exhibition become *ipso facto* Fellows. There should be some reward for merit beyond the medal, and some more lasting distinction. The Judges could be elected from the Fellows, and other benefits given to the Fellows which would make the title both desirable and honourable, as are the titles of A.R.A. and R.A. at the Royal Academy. If the annual exhibition at Pall Mall is to do for photography what the Royal Academy does for painting (and this should be the case), it is only to be done by a just but more rigid weeding of pictures. For many years some very second-rate work has been hung that should not be, for there are smaller exhibitions where such work can be received; in fact, it is to be hoped that soon it will come to pass that it is considered an honour to get a picture hung, let alone getting a medal.

There are complaints of the smallness of the Gallery, but it seems to me the Gallery is at present quite large enough to hold all the really good work sent up, and such alone is wanted at Pall Mall. Again, the question of limiting the number of pictures sent by each exhibitor may produce a better show.

I write this briefly in hope that my suggestions may be read, and, if considered worthy, acted upon. My only desire is to see the art of which I am so fond advanced by an exhibition of masters in it, and not degraded by mediocre work.—Yours truly, P. H. EMERSON.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

A MEETING was held in the small room attached to the Gallery, 5A, Pall Mall East, on Tuesday, 23rd inst., Mr. T. SEBASTIAN DAVIS, F.C.S., in the chair.

Mr. W. ENGLAND exhibited a new form of plate-box for use with a changing bag. The ordinary grooves are replaced by small frames containing two plates with a sheet of stout black card between. In connection with the box is a double dark slide fitted with a spring lid at one end, and just large enough to permit the insertion of the afore-described frames, each containing two plates.

Mr DEBENHAM remarked that the apparatus was very practical; in changing-boxes the cases are generally made too small, the result being that the plates often stick in their slides while in process of transfer. One plan of avoiding this difficulty, and at the same time the presence of pinholes in the resulting negatives, is to dust out the case each time previous to use.

The CHAIRMAN passed round a negative developed according to a slight modification of a recently-published formula containing washing soda, sulphite, citric acid, bromide, and pyro. It was claimed that very brilliant results were obtainable by the published method. He, however, only succeeded in developing up the high lights; but on adding to the formula 1 minim of ammonia and 1 grain of bromide per ounce, a developer yielding very vigorous results was produced. Unfortunately, the large proportion of alkali, although partially neutralized by citric acid, caused frilling, so he would be glad to know of a good substratum adapted to the requirements of gelatine plates.

Mr. COWAN believed that if the citric acid had been left out, frilling would not have set in, and much less exposure would have been required. Most commercial plates will stand the alkali.

Mr. DEBENHAM remarked that citrate of soda—formed from the action of citric acid on sodium carbonate—no doubt served to give intensity, but a much longer exposure was required.

The CHAIRMAN remarked that the use of sulphite of soda in hot weather causes red and green fog.

Mr. W. BROOKS said that while recently photographing paintings, he had developed twenty-eight plates with the same solution, and the translation of colour and general effect in the resulting negatives was better than if a new solution had been used each time.

The discussion then turned to the necessary quantity of chrome alum used in emulsion.

The CHAIRMAN was of opinion that not more than one-fourth, and not less than one-eighth, of a grain per ounce should be used, and he had tried the effect of adding one grain to the ounce, but found that the whole of the gelatine was coagulated, and that during the recent hot weather he had experienced frilling in films containing a quarter of a grain.

Mr. ENGLAND, Jun., said that probably in the latter case the emulsion had not received sufficient washing, and that frilling often results from the presence of decomposed gelatine and soluble salts. He also remarked that he had kept an emulsion at least a month during the hot weather, previous to coating, without any decomposition taking place; but then he had added thymol in the proportion of half a grain to the ounce.

The question was then put from the chair: "Has anyone ex-

perimented with Mr. Law's developer containing a mixture of potassium and sodium carbonates in place of ammonia?"

Mr. COCKING said that he had, and was well satisfied. He considered the subject before the meeting was of very great importance, as he had suffered lately very much from the effects of ammonia. The symptoms were a catarrh in the nose, deafness, and general nervousness. He would be glad to know of a remedy.

Mr. ASHMAN advised the use of a smelling bottle containing glacial acetic acid.

Mr. COCKING had used the acetic, and was temporarily relieved.

The meeting was then adjourned.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 18th inst., Mr. W. ACKLAND in the chair.

The colour of gelatine negatives developed with soda and other carbonates again formed a subject for discussion, and the three plates sent by Mr. Ashman to Mr. Cowan for development were shown, which were developed as follows:—No. 1, carbonate of potash (crystals); No. 2, carbonate of ammonia; No. 3, carbonate of soda and potash (crystals). Nos. 1 and 3 were intensely yellow, and took a longer time in printing, the time required being:—No. 2, 12 minutes; No. 1, 19 minutes; No. 3, 22 minutes.

Mr. COWAN held that the majority of those who employed soda or potash obtained yellow negatives, and gave preference to carbonate of ammonia; in each case where he obtained yellow images, Mr. Ashman had, with similar plates, produced black films.

The CHAIRMAN observed that the difference between common washing soda and recrystallized carbonate of soda might account for that result; washing soda frequently contained caustic soda, a powerful alkali, whereas pure recrystallized carbonate of soda was almost neutral.

Mr. W. M. ASHMAN passed round some plates handed to him by a member at the previous meeting, which were said to give yellow films with the soda developer; in his hands they were not in the least yellow, although they were the most rapid plates he had yet met with.

Mr. W. TURNER exhibited a series of paper negatives and prints, both on albumenized and plain paper; also examples of blue printing, most of which were of large size, and similar to those described on page 526. The method adopted was that of rendering the picture or drawing to be copied translucent by means of lard diluted with turpentine, one part of the former to three parts of the latter. Mr. Turner preferred boiling these for three minutes, which he said killed the grease; the mixture is then rubbed over the drawing, and when surface-dry, is placed in a printing frame with sensitized paper, and a negative obtained; this negative is fixed in an old hypo bath, rich in silver, and washed in the usual way, after which a positive is taken from the paper negative. The plain paper was prepared by floating Saxe paper on the following:—

Sodium chloride	200	grains
Gelatine	30	,,
Water	20	ounces

Dissolve the gelatine and chloride separately, and mix; float three minutes. When dry, sensitize on—

Silver nitrate	1	ounce
Citric acid	1	drachm
Water	14	ounces

The paper will keep good for six weeks.

Mr. H. L. STARNES directed attention to a sample of silver-coated wire which he thought suitable for making a mesh for cutting up emulsion-jelly before washing; he said it was very cheap, as it was used for winding around violincello strings, and could be obtained at any musical instrument shop.

Mr. W. K. BURTON enquired if anyone had found harm to result from the use of ordinary copper gauze.

Mr. J. B. B. WELLINGTON used it even with ammonia emulsions, but did not allow the emulsion to remain long enough to attack the copper.

Mr. BURTON'S experience was that the ammonia acted very rapidly on copper gauze.

Mr. STARNES passed round an emulsion-coater made of pine in the form of a developing tray; a slit beneath, somewhat similar to Mr. T. G. Whaite's, permits the escapement of sufficient

emulsion to coat half-a-dozen plates, arrayed on a levelling table at one sweep.

Mr. DEBENHAM: Does the emulsion get between the plates?

Mr. STARNES had not found it do so; he took the precaution of securing the plates at each end of the levelling table by means of carriage pins. He then passed round a negative which presented a broad opaque band around two sides of the plate, and enquired the cause.

Mr. BURTON attributed the marks to a defect in drying, an opinion held by Mr. Debenham and several others.

Mr. HADDON thought the marks were due to insufficient washing; soluble salts being left in the film would cause parts of a plate to be more sensitive than others, so that a partial reversal might occur.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—A special meeting of the members will be held (in accordance with a resolution passed at the June meeting) at the House of the Society of Arts on Thursday next, October 2nd, at eight o'clock, to consider the future of the Society, after which Mr. W. Ackland will read a paper on "Furuell's Lens."

THE BIRMINGHAM AND MIDLAND INSTITUTE.—A Photographic Section has been established, and we note that on November 12th next, Mr. A. J. Ball will read a paper on the Photo-Filigraine process. The following extract of the last annual report will give some notion of the activity of the Photographic Section:—"The Photographic Section has continued to do useful work in spreading the knowledge of that interesting art, now rendered so easy by the invention of dry plates. The number of members has increased to 39. Several papers have been read by different members, and the exhibitions of landscape photographs in the lantern have afforded much interest even to the non-photographer. The excursions have, however, been but poorly attended, which is to be regretted, as the beginner would profit by the advice of the more experienced—even in the taking of the picture. Rules have been adopted for the exchange of prints and for the sale at a nominal price to non-photographers, who have been glad of the opportunity of obtaining momentos of places visited by the Society. Arrangements have been made for the albums of the Postal Photo. Society to be exhibited at the meeting, whereby the members will be able to compare their work with other amateurs. The surplus funds of the Section have been devoted to the purchase of a number of books likely to be useful to the members of the Section."

THE PROPOSED AMERICAN EXHIBITION IN LONDON.—A novelty in exhibitions is proposed for 1886: a comprehensive collection of all the numerous things that the United States can show us. Should the proposal be carried out on a sufficiently large scale to make the Exhibition a thorough success, much will be accomplished towards building up a more complete unity of feeling between the one people which now form two great nations. It is proposed that the Exhibition shall open on the 1st of May, 1886, and it is intended that a complete representation of the arts, manufactures, employments, and productions of the United States shall be given. The characteristic amusements of the American people are not to be forgotten. At an American theatre performances will be given by American actors, and by the negro singers. A number of the best-known Americans artists, in Europe and America, have undertaken to furnish the Fine Art Galleries, and amongst many other works will be portraits of the most prominent personages of the United States. There will be in connection with the Exhibition such sports as may be practicable, including roller-skating, base-ball playing, la-crosse, trotting matches, bicycling tournaments, billiards, and the American variations of every sport which is popular in the old country. The principal phases of American life will be represented in the Exhibition, from a broker's office in Wall Street, to the camp fires in Nevada. A Californian wine-shop; Florida fruit stores; Indian canoe-makers and mat-weavers; ice drink pavilions and bars; restaurants, with the products of

the Eastern and Pacific coast, and of the Northern and Southern States, characteristically prepared, and served by white and coloured male and female cooks and waiters, will help to mark the peculiarities and variety of American social development. There will be a press pavilion; an Atlantic Cable Office; an electrical elevated railway, and reproductions of the façades and interiors of remarkable hotels and public buildings. Influential people in London are in favour of the scheme, and passing over the names of two dukes, four marquesses, fifteen earls, and thirty-three lords, we find the names of very many illustrious men as supporters on this side of the Atlantic. The London agent is General Norton, 7, Poultry, E. C.

THE dead season in town is generally a busy season at Trafalgar Square, and one of the first changes a Londoner looks out for on his return home he finds within the walls of the National Gallery. This year the authorities have been busy with the building rather than with the pictures. One of the galleries has been closed for renovation, but will be opened again in the course of the week, and the whole series of rooms will thus be gradually put to rights. Indeed, the abundance and the pervasiveness of the soot, smoke, and dust which collect each year on these walls show beyond doubt the central character of the situation. They explain also the need for glazing so many of the pictures. Many gaps will also be found upon the walls, and some very favourite canvasses are withdrawn; but the visitor may take confidence when he learns the cause. These are not pictures that have been lent to provincial exhibitions, and their absence will be of short duration. The more important works are being photographed in the studio outside the building. London fogs may come upon us at any moment, and these bright September days are being prudently utilised.—*Daily News.*

SUBSTITUTE FOR A GROUND GLASS.—While out viewing the other morning I was so unfortunate as to break the ground glass of my camera. As a substitute I stretched my white handkerchief across the back of the camera, closing the empty frame over it, and found no difficulty in securing a good focus. The fact may be of use to others.—F. A. JACKSON, in the *Photographic Times.*

PHOTOGRAPHIC CLUB.—The subject for discussion on Oct. 1st will be on "Artificial Lighting." At nine o'clock the meeting will be resolved into a special general meeting. Saturday outing at Blackwall by first train after two o'clock.

To Correspondents.

*** We cannot undertake to return rejected communications.

PALMAM QUI MERUIT FERAT.—Your enclosure touches on points of considerable importance, and we hope you will continue to give attention to the subject.

ETA.—The method of filling up the form is made sufficiently clear by the information given thereon. We have posted you one.

WILLIAM WOOD AND CO.—There must have been some mistake; let us know if anything of the kind should occur again.

DAMAGES.—No doubt you are entitled to compensation, but we do not think that any sum you are likely to obtain will cover the expense and trouble involved in getting it. The fact of your having had no written or stamped agreement is likely to make proceedings difficult. At any rate, you should go to the house of the person and demand the return of the negative.

LIONEL.—The exact method employed by the firm using the title quoted is a trade secret; but during the past two years methods of obtaining similar results have been described in the PHOTOGRAPHIC NEWS.

ASPIRING AMATEUR.—As soon as space will allow, we will publish a series of articles on the subject.

A. BROWN.—Our "Practical Paper" this week embodies all the information you ask for.

J. G.—1. As a rule they are not so fitted on both sides. 2. Plain white screens. 3. A so-called whole-plate lens, having an equivalent focus of about ten or twelve inches.

R. D. B.—Put the black varnish on the glass before mounting the picture, and let it dry thoroughly.

WM. M.—We are inclined to attribute the markings to imperfect fixation. But it seems that the gelatine is hard in parts, so that some portions will require a longer time than others. Allow the plates to remain longer in the hyposulphite bath.

L. NORMAN.—Excellent as it may be, you cannot reasonably expect such an interchangeable set to be equal to the separate instruments which it is intended to replace.

C. M. EBSWORTH.—1. The glass is not sufficiently good in quality, as the pimple-like projections and the rough places will be certain to cause defects in the films. A rough test of the general quality of glass is afforded by the compactness and solidity of a pile of the plates, any inequalities of surface naturally preventing close contact. 2. Surely chloride must be intended: at any rate, you would do well to make up a trial batch on this supposition. 3. Remove the varnish by means of alcohol before proceeding. Abundance of spirit should be used, its action being assisted by gentle friction with a soft camel's-hair brush, and when all seems to be dissolved, the plate should be well rinsed with abundance of spirit.

E. EDWARDS.—Received.

W. T. D.—1. It will decompose rapidly after mixing, and you cannot depend on it after the first day. 2. Apply to the manufacturer. 3. They are printed on an ordinary lithographic machine.

B. CHASE.—The collodion should be of a tough and elastic kind, and, although there is no need whatever to have it iodized, it is sometimes convenient to use an iodized sample rather than to search for or prepare plain collodion. The iodizing salts are dissolved out by the water, and do no harm.

H. C.—1. Such an excess of acid will serve to make the plates extremely slow, and this without any compensating advantage. 2. Yes, very good, but subject to the fault referred to. 3. A lens having a focus of between 7 and 8 inches will prove most suitable. 4. One part of bichromate of potassium to six of gelatine. 5. It would be almost certain to cause mischief; the products of combustion into the open air by means of a chimney.

T. WESTON.—Soak the prints in hot water so as to remove as much as possible of the size from the paper, after which, dry them and wax them. The most convenient method of waxing is to make a slab of slate hot, and, after having covered it with a sheet of plain paper, to lay the print on it and rub with a cake of white wax. When the whole of the paper is saturated, remove the excess by means of blotting-paper.

Photographs Registered.

Mr. J. CLAYSON (Nottingham)—Photo. of Group of Dr. Kavanagh, Dr. J. Val d'Eromo, and another.

Mr. A. HONEY (Chatham)—Photo. of Lieutenant Waghorn.

Messrs. E. HAWKINS & Co. (Brighton)—2 Photos. of 'The Gentlemen of England" Cricketers; Photo. of the "England Eleven" at Lord's, July 21, 1884.

Mr. W. MORTIS PHILLIPS (Southampton)—5 Photos. of Rev. H. H. Carlisle.

Messrs. JAKEMAN & READING (Ramsgate)—Photo. of Archbishop of Canterbury.

Mr. W. G. HONEY (Devizes)—Photo. of a Child in a Foot-bath.

The Photographic News Registry.

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Lady Retoucher.—C. Heinemann, 6, St. Peter's-st., E.
Operator or General Assistant.—F. P., 6, Rochester-sq., Camden-rd.
Operator and Retoucher (£3).—A. B., 36, Jewin-st., E.C.
Negative Ret. & Spotter (lady).—F. E. Cary, 42, Mall-rd., Hammersmith.
Photographer and Artist.—X. Y. Z., 75, Alexandra-rd., Norwich.
Improver, with salary.—V. G., Gloucestershire.

Employment Offered.

Retoucher in spare time.—J. Cole, Park-rd., Acton.
Retoucher in middle of October.—G. W. Webster, Chester.
Operator, good retoucher.—R. Cox, 37, White Ladies-rd., Clifton.
Operator, good enlarger.—Enlarging Co., 36, Cannon-st., Birmingham.
Finisher of Prints.—Manager, 91, King's-rd., Brighton.
Retoucher and Assistant Operator.—211, Clapham-rd., S.W.

The Photographic News.

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THE CORPUS-CHRISTI PROCESSION AT VIENNA, 1884.

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1361.—*October* 3, 1884.

CONTENTS.

ENLARGEMENTS UPON CANVAS.

A SPECIFICATION of a continental patent applied for by Messrs. Winter, of Prague, and dealing with a method of enlarging on canvas which does not differ very much from that already detailed in the "Studios of Europe," has been published. As Messrs. Winter's method of enlargement is that which has proved most practical and easy in the hands of those who have not been accustomed to work of this character, details will now be given embodying the points of importance to be found in both places.

A fine compact and closely-woven artist's canvas—not too dark in tint—must be used, but such a material as is sold already painted or primed is not suitable. This must be thoroughly washed in hot water, then rinsed with cold water, after which it is stretched so as to remove folds, and allowed to dry.

The salting solution may be made up with bromide alone, or with bromide and iodide, the latter being, perhaps, preferable on the whole.

1.—*Bromide Salting Solution.*

Bromide of potassium	4 parts
Bromide of cadmium	1 part
Water	240 parts

2.—*Bromo-iodide Salting Solution.*

Bromide of potassium	3 parts
Iodide of potassium	1 part
Bromide of cadmium	1 ,,
Water	240 parts

Whichever salting solution is used, the mode of application is the same. A horizontal bath, considerably larger than the sheet of canvas to be dealt with, is tilted, and the salting solution is poured in; but care must be taken to leave so much space uncovered as corresponds to the size of the canvas to be sensitized. The sheet of canvas is now held by two assistants, so as to correspond to the portion of the bath in which there is no liquid, and a stout glass rod is next lowered so as to bring down one end of the canvas, after which the sheet of material is drawn steadily under the rod. The canvas is in this way thoroughly and uniformly saturated with liquid, and the next step is to hang it up in a warm room to dry. It need scarcely be remarked that there is no need to exactly follow the above directions for salting the canvas, it being sufficient to draw the material through the liquid in any way which may be convenient; but it is advisable to draw over a glass rod if practicable, so as to strike off the excess of fluid; the above described method is, however, convenient when a sufficient number of persons are at hand, four being required when a large sheet—say, three feet by four feet—is being treated.

When dry, the material is sensitized with an acid solution of silver nitrate, prepared as follows:—

Sensitizing Bath.

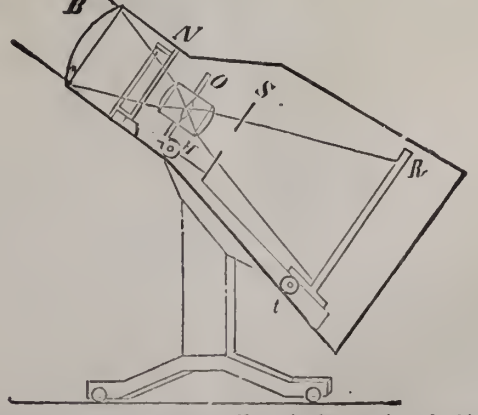
Nitrate of silver	4 parts
Citric acid or nitric acid ...	1 part
Water	140 parts

The citric acid will be preferred in most cases, but something depends on the canvas used, and the sensitizing is conducted precisely in the same way as the salting. In drying, it is necessary to take care that the canvas is in no way rumpled or creased.

Exposure may be made either in the solar camera, or by artificial illumination; Messrs. Winter preferring the electric light, and employing a six horse-power engine, and a Siemens dynamo machine. The optical arrangement is a simple one, a condensing lens being set in front of the arc light, and immediately the other side of the condenser is a camera with the negative in the position usually occupied by the focussing screen; all that is now required being a screen on which the image can be projected for focussing. The chief point in arranging such an apparatus is to take care that the image of the arc as formed by the condensing lens is formed exactly in the position occupied by the diaphragm of the objective.

Messrs. Winter make the enlarging arrangement multiple, so as to economise the light as much as possible; three enlarging systems being made to converge towards the electric lamp.

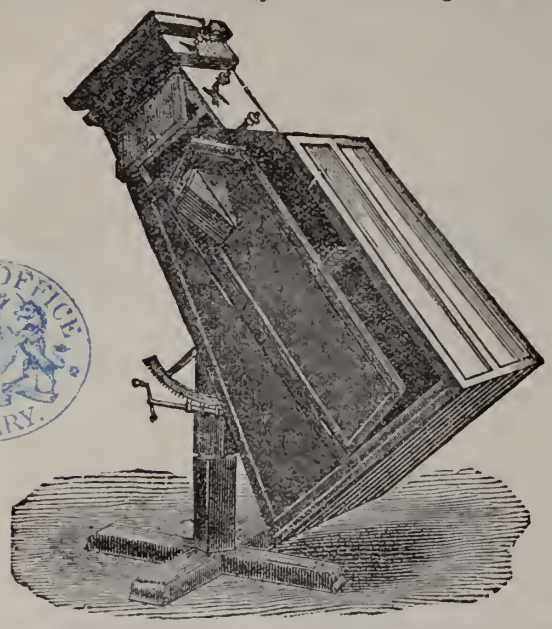
A convenient arrangement of the solar camera is exemplified by the following sectional sketch, and it is by no



B, condenser directed towards sun; N, carrier for negative; O, objective actuated by a rack-work, given by the milled head, H; S, screen to cut off superfluous light; R, adjustable screen to take canvas or paper.

means difficult to fit up such an apparatus in an extemporised form, and from the subjoined diagram some idea of

the external aspect of the apparatus may be gathered; the worm and arc-rack, by which the direction is kept, being shown to the left of the figure. When a vignette effect



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is to be produced, the screen, S, is serrated like a paper vignetter.

For very large sizes, the solar camera is by no means convenient; and if it be not desirable to fit up a room with the electric light, an arrangement like that devised by Solomon for use with the magnesium light may be used. Explanation is scarcely required, and it is obvious that such an apparatus will serve equally well, whether the magnesium light is employed as represented, or whether the electric light is used.

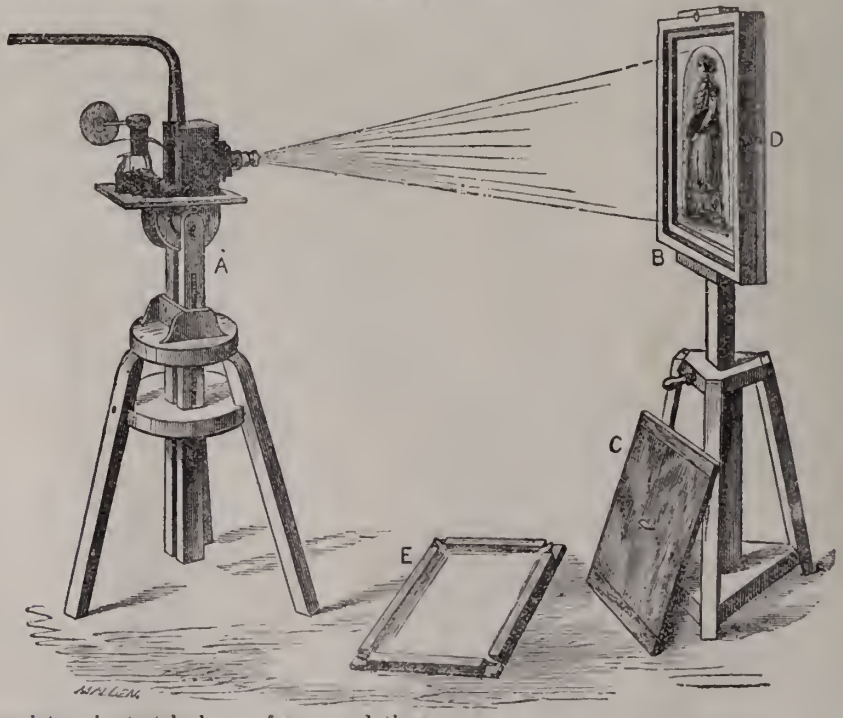
As in all photographic operations, the exposure must be learned by experience, but something over ten minutes may be required with the electric light when the scale of enlargement is considerable; still, with good sunlight and a properly-arranged solar camera, a much shorter exposure will suffice. In any case, there should be a distinct outline on the canvas before development.

The exposed canvas is immersed into the developing bath, this being made up as follows:—

Pyrogallic acid	...	...	...	10 parts
Citric acid	...	...	...	45 ,,
Water	...	...	...	410 ,,

The developer should be used slightly warm, and about ten minutes is required to bring the picture properly out. A thorough washing is required after development, and the next step is to tone the image, this being done with such a toning bath as is employed for prints on albumenized paper—as, for example, the ordinary acetate of soda and gold bath.

Fixing, again, requires no special comment, the usual hyposulphite solution, consisting of one part of the salt in five of water, being used, and immersion for ten minutes being ample, as the canvas is very permeable to the liquid. A very thorough washing should be given—let us say a dozen changes of water—extending over a period of twelve or sixteen hours.



When dry, the picture is stretched on a frame, and the surface is slightly waxed in order to smooth down the rough fibres which stand up, and to give a brilliancy to the resulting picture. A waxing paste similar to the so-called "encaustic paste" used for silver prints may be used:—White wax in shreds, 1 ounce; oil of turpentine, 5 ounces. Such enlargements as those described are sometimes sold as finished pictures, and at other times are painted upon by an artist.

GLASS.*

Tenth Article.

Visitors to the Health Exhibition at South Kensington may there see in the French Court a complete set of tools and appliances for blowing glass by mechanically compressed air. There is a full-sized model of the blowing-

* Reference to previous articles, vol. xxvi., pages 675 and 737; vol. xxvii., pages 3, 93, 226, 419, and 757; vol. xxviii., pages 338 and 356.

hole in the furnace, together with the pipes and connexions to the air reservoirs. It is called the "Système Appert Frères," constructed by Count Delamarre, 24, Rue Godot de Mauroi, Paris. An inspection of the models and plans will give a clearer idea than any written description can convey. The "system" is by no means new, for a dozen years ago compressed air was employed in glass-blowing by one English manufacturer, the apparatus being nicknamed "the iron man." By its aid it was expected that very large sizes could be blown, such as were beyond the power of a man's lungs to produce; and this was so far realized, but it was found that the process was not so handy, nor so completely under the control of the blower, probably because of the inconvenience of the flexible pipe or hose, which prevented that extreme freedom which the blower appears to enjoy when not so fettered. Hence the system was abandoned in favour of the ordinary process of forcing air into the pipe by the mouth and lungs. Glass-blowing is classed among the unhealthy trades, and it is, perhaps, to be regretted that some kind of mechanical arrangement cannot be perfected so as to prolong the men's lives, and diminish the distress occasioned by reason of the injury to the lungs and chest which frequently terminates the blower's existence.

The methods of blowing and flattening sheet glass, described on pages 338 and 386, are those invariably followed in making all kinds and substances of sheet glass. Whether it be the thinnest 14 ounce Belgian, or the stoutest 42-ounce English, the process is practically the same; the only departure or variation being when making *coloured glass*.

Glass can be tinted or coloured of every conceivable hue to suit the taste of the most fantastic and the critical; therefore, we find that coloured glasses have played an important part in history for ages past. At the present day, the employment and consumption of coloured glass is simply enormous. Without venturing into figures, it may safely be asserted that never in the world's history has coloured glass become so much the rage as at present. Leaving aside the church restoration mania which convulsed Great Britain some twenty years ago, and looking at matters of to-day, wherever we glance we see coloured glass. In churches, chapels, schools, and convents; in palaces, mansions, villas, and cottages; in clubs, institutions, shops, restaurants, and public-houses; in railway stations, on lamp-posts, and, in fact, in every conceivable place, there we find some employment for coloured glass. We are not speaking particularly of coloured glass as it concerns the photographer, because there is only one colour that really concerns him—viz., *ruby* or red. We beg pardon; of late the photographer has affected the *green*. However, not to be exclusive, it may interest the reader to know that colours in glass are produced by the oxides of metals, and by a few other substances; the following list showing that different colours are obtainable according to the state of oxidation of the metal:—

Blue.—Oxide of cobalt, deutoxide of copper, perchloride of gold.

Yellow.—Oxide of silver, oxide of antimony, protoxide of iron, ferrous oxide of manganese, carbon, protoxide of copper.

Green.—Deutoxide of copper, deutoxide of iron, oxide of uranium, and by mixing the colouring agents employed in making blue and yellow.

Violet.—Manganese, oxide of gold, and by mixing red and blue agents.

Red.—Oxide of gold, manganese, oxide of silver, protoxide of copper, and peroxide of iron mixed.

White (opal).—Deutoxide of tin, phosphate of lime from mutton bones, arsenic.

Black.—Oxide of iridium, manganese in excess, oxides of cobalt, copper and iron in excess.

And so on. It will be apparent to the most casual reader that the mixture in various proportions of the colouring agents aforesaid enables the glass maker to produce every colour in the rainbow—or out of it. Further, that the proportion of the colouring agents determines the depth or strength of colour in the resulting glass, so that it is quite competent for the mixer to produce the palest tint or the deepest colour at will.

Coloured glass is made in two ways—either as "flashed," when the colour is really a thin skin on a basis of clear glass, or as "pot-metal," or solid (*massif—French*), in which the colour pervades the whole of the substance of the glass.

Suppose we follow the process in the fabrication of a sheet of coloured glass; let it be ruby, and let it be understood that it is photographic ruby that is desired.

In the furnace, almost side by side, there must be two pots of metal ready for blowing; one must be ordinary window glass metal, and the other must be ruby for "flashing" or "casing." The composition of this ruby metal varies according to the formula of different makers, but it may safely be stated as being composed of about one part of protoxide of copper to one hundred parts of ordinary window glass metal, and sometimes there is added about one per cent. of protoxide of iron (iron scales) or oxide of tin. This mixture gives a glass sufficiently dense in colour for flashing.

The blower dips his clean pipe into the ruby pot and gathers thereon a certain weight of the ruby metal; he then gathers over it the white metal, and he forthwith proceeds to blow the cylinder, the inside of which has the thin skin of ruby. If the blower wants to produce a full, rich, dark tone of ruby, he would gather, perhaps, one pound of ruby and twenty pounds of white; but on the other hand, if he wished to produce a pink, or rosy kind of glass, he would gather very sparingly out of the ruby pot, so as to keep the flash as thin as possible. The thicker the flash the darker the ruby; the thinner the flash, the paler will be the glass—always supposing the same ruby pot is being blown from. There is a vast difference in ruby or red glass. Some is made from materials which make it utterly valueless for photographic use; it transmits blue rays when examined by the spectroscope, and this probably has given rise to some of the confusion, and misunderstandings, and bickerings among photographers who, perhaps, do not know that there is a difference, and that there is a pale ruby glass and a rich red, all going under the one designation of ruby. Ruby can be flashed upon any other colour; it can be flashed upon yellow, or blue, or green, or, in fact, upon any base that may be desired. Ruby cannot be made solid (*massif*); it would be no longer ruby—it would be black, quite opaque.

So-called ruby can be made solid if it is composed with perchloride of gold (purple of Cassius), but it is certainly not a red, but more correctly a deep pink. This is the colour employed in making chimnies for use in lighthouses, where great translucency is required.

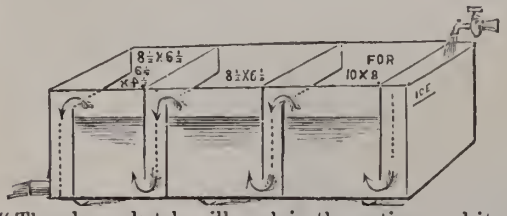
Green glass is also made by the employment of copper and iron; but the metal in this instance is in a different state of oxidation than when used to make ruby. In making green glass the copper is usually employed in the form of the sulphate, which is mixed with the batch by being dissolved in water, and poured over the sand, &c., and then dried before being shovelled into the pots. The tone of the green can be varied by the proportion of iron to copper, but such glass as that known as cathedral green is made by about ten per cent. of copper sulphate and five per cent. of sulphate of iron, added to the ordinary mixture for window-glass. Frequently a small percentage of blue mixture is added to get a blue-green, or yellow mixture to get a yellow-green. Green is seldom blown except as pot metal, in which the colour pervades the whole substance of the glass, the use for flashed green being very limited. In all pot colours the metal is gathered and blown just in the same manner as ordinary window-glass, the chief care being to obtain uniformity of substance in

the sheet, otherwise the colour or tint may be very pale in one part, and very dense in another. The same remark applies to flashed colours; if the flash is unequal, the colour varies considerably in depth. When cylinders of coloured glass are blown, they are split and flattened just in the same way as ordinary window-glass.

The production of coloured glass calls for considerable skill on the part of the glass maker. He must be a chemist, and understand thoroughly the effect produced by every addition of an ingredient; rule-of-thumb is all very well in its way, but it often happens that whole pots of glass go wrong, the colour will not "come," or turns out to be a different one to what was expected. The skilled glass maker sees what is wrong, and by altering his heat, or by the addition of a substance either rich in oxygen or an absorbent of oxygen, he can speedily turn the metal to the correct colour sought. The tints and colours are so manifold, that it is really surprising to know that a skilled man can compose a batch, and hit the tint or colour of a given sample; indeed, the experienced glass-maker can, on looking at a sample of coloured glass of even a peculiar tint, sit down and write a formula, which, when compounded and founded with care, will come out an exact match, even although he may never have made that identical colour before.

A WASHING APPARATUS FOR NEGATIVES.

Mr. Germanus Shaw is good enough to send us the following description of a washing trough, constructed by Mr. Charles Stortz. Mr. Shaw says:—



"The above sketch will explain the action, and its complete success may be proved by putting a small quantity of any colouring matter (Judson's dye picture) into the first compartment, and watching the result. The hypo-sulphite, as it is dissolved off the plate, sinks to the bottom of the tank, and as it is the bottom water from each compartment that is forced to flow into the next, and thence to the outside, it will be readily seen that all the plates are thus subjected to a continually changing stream of fresh water. Nor is this all: during the hot weather the troubles of frilling may be effectually avoided by a small supply of ice in the first compartment, without any danger of scratching the films, which it cannot touch.

"Although the tank is not a syphon, it will never overflow (if ordinary care is used to regulate the supply), and should the supply of water suddenly fail, this invention has the advantage over syphon washers, as it does not slowly drain off the water, leaving the films to dry in irregular lines, but the tank still retains sufficient water to quite cover all the plates that are in it. This feature is invaluable where a cistern sometimes empties without any previous warning.

"The comparatively small cost of an apparatus of this kind is more than repaid by the sense of security, and satisfaction of feeling that one's negatives are thoroughly freed from the destroying angel—hypo. I strongly advise all who value the permanency of their work to try it."

A DIVIDING PRESS FOR EMULSION WORK.

BY L. DAVID.*

The apparatus about to be described is especially available for those who may wish to work on a large scale, and the arrangement consists essentially of a cylinder of strong glass, which should be as uniform in the bore as possible. This cylinder is set over a sieve of stout plated brass wire, having a mesh of 2 m.m. (about one-twelfth of an inch). By means of a stout framework of wood, the cylinder is held in position, and by undoing two thumb-screws, the cross-head of the framing can be removed easily, so as to liberate the cylinder. A wooden piston, provided with an

india-rubber packing-ring, is forced down into the glass cylinder by a screw, as shown in the drawing. With the apparatus in question, the work of dividing the emulsion is easy, and the cut threads or strips are allowed to drop into a porcelain vessel placed below the base-board of the apparatus.

* Abstracted from the *Photographische Correspondenz*.

By-the-Bye.

PHOTOGRAPHING ON THE BLOCK OF THE WOOD ENGRAVER.

The wood engraver is not always a draughtsman, and as a consequence very many skilful wood-engravers are entirely dependent upon others for the drawing or sketch which is invariably made on the wood block before the actual cutting or engraving is commenced. Still, on the other hand, it is not difficult to find those who unite in themselves the artist, the draughtsman, and the engraver.

The artist or draughtsman, when he makes his drawing upon the boxwood block—this block having been previously whitened by being rubbed over with a white pigment, such as white lead—does not trouble himself to draw every line by which degrees of shading are represented in the finished engraving, but he merely endeavours to show the required degrees of light and shade; indeed, it is generally considered better that the artist should make the picture in gradated tints or washes, and leave the engraver to exercise his own judgment as to the best means of translating these tints into lines or cross-hatching.

A drawing in tints or washes, and very nearly resembling a photograph, answers very well indeed; and as the engraver works upon it, he has merely to translate each gradation of tone into a system of lines or dots, more or less closely packed together, and of appropriate width. This being the case, the engraver was not slow to call in the aid of the photographer; but the result was not altogether satisfactory to the wood-engraver, as he sometimes found that the block had been so far saturated with aqueous liquids as to become rotten and unsound when printed from; while at other times a more or less tough film covered the wood, and the consequence was that it became very difficult—indeed, almost impracticable—to cut clean and sharp lines.

In order to produce something which shall be acceptable

to the wood-engraver, not only must the picture be made directly on the wood without the intervention of any film, and the free use of aqueous liquids must be avoided; but it must be easy to add to or take from the photographic picture. All these conditions appear to be satisfactorily fulfilled by the method of making a transfer in fatty ink by a photo-lithographic process, and then transferring this to the previously whitened block by pressure, as already described in the PHOTOGRAPHIC NEWS 1880, page 409, and 1883, page 402. Still, notwithstanding the fact that many persons are now working these fatty transfer methods with perfect success on a considerable scale, experience shows that the general photographer seldom works a bichromate method with success if he only practises it occasionally, as the behaviour of bichromated organic bodies is very dependent upon atmospheric conditions, and the influence of varying conditions is very difficult to control unless a very vigilant watch be kept on all variations.

When talking over this matter the other day with Mr. Werge—who is an old wood-engraver—some surprise was expressed that among the more or less novel methods of making photographic pictures on the wood block which are being so frequently brought forward, so little attention should be given to one of the earliest modes of procedure, and one which is completely free from the objections that have been mentioned. The method referred to is one which was suggested in our editorial columns in 1858*—over twenty-five years ago, and it consists in rubbing the face of the wood block with a pasty mixture composed of oxalate of silver and water, a trace of gum being added if required. Supposing that the block is four inches square, it is sufficient to take as much of the oxalate as will lie on a threepenny-piece; and after having sprinkled this on the surface of the wood, to rub it well in with the tip of the finger; a trace of pure water or thin gum being applied to the finger from time to time.

The amount of moisture communicated to the block during this process need not be more than is involved in the usual process of facing with white pigment, and is altogether insignificant. As soon as the coating with the oxalate has been finished, the block may be exposed at once under a reversed negative, and the prepared block may be stored away in a dark place for future use. In order to increase the sensitiveness of the oxalate, it is well to slightly fume the block with ammonia, just in the same way that albumenized paper is fumed (see present volume, page 346). If both negative and block are carefully registered into one corner of a deep printing-frame, it becomes practicable to remove the block from time to time, so as to watch the progress of the exposure.

If the engraver is to work by lamp-light, no fixing or further preparation of the block is required, as the oxalate of silver does not darken to any notable extent under these circumstances; and even if the engraver does his work by daylight it is quite practicable to cover the block with a mask of yellow paper, and just to tear this away piecemeal as the work progresses. At any rate, this is the experience of Mr. Werge, who has worked practically with the process.

Some recent experiences of our own show, however, that it is quite easy to so far de-sensitize the adherent oxalate of silver as to render it unnecessary to take any special precautions for screening the block from the light while the engraving is in progress.

On removal from the printing-frame, the block is fumed with hydrochloric acid for a few seconds, the most convenient method of doing this being to pour a little of the strong commercial acid into a flat dish, and to support the block over it—face downwards, of course—by means of a couple of glass rods, or in any way which may be convenient.

Another, and perhaps more complete mode of de-sensitizing the oxalate, is to slightly moisten a sheet of blotting-paper with a saturated solution of common salt, and to lay this paper on the face of the printed block; contact being established by a pad and weight. Ten minutes are generally sufficient, and the block need not be damped nearly so much as it would be if a drawing were made upon it with washes of India ink.

The negative required is a reversed one—that is to say, one which will give a print having the sides interchanged against each other, and a very convenient method of making such a negative is to direct the uncoated side of the plate towards the lens when the exposure is made in the camera. Of course the back of the plate must be clean, and in focussing allowance must be made for the thickness of the glass.

* PHOTOGRAPHIC NEWS, vol. i., page 193.

Press of matter compels us to allow our "Practical Paper" (No. 11, "Making Lantern Slides") to stand over until next week.

HOW TO PHOTOGRAPH MICROSCOPIC OBJECTS.

BY I. H. JENNINGS.

LESSON 7.—PRINTING.

The advice given in the introduction is here repeated: let the photo-micrographer make all his own silver prints, as in no other way can he hope for results of a satisfactory nature. The process is not difficult, and, when once mastered, the microscopist will have the pleasure of seeing his pictures *real* representations of the originals, instead of being little else than caricatures, which is often the case when the negatives are entrusted to another to print. A professional photographer may be able to produce perfect specimens of art from portrait or landscape negatives, yet fail entirely when he tries to print a photo-micrograph, simply from not understanding the nature of the object represented.

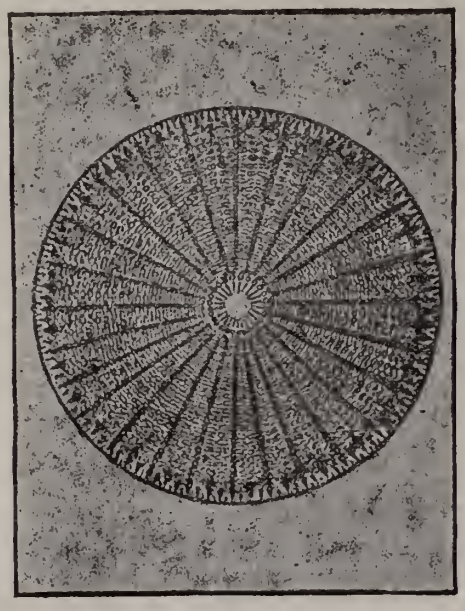
Ready-sensitized paper may now be procured of great excellence at a moderate price. The photo-micrographer should purchase the best obtainable, for the best costs at first very little more than the worst, and in the end costs really less, as there will be no defective sheets to reject, to say nothing of the superior quality of prints to be produced on good paper.

Frequently a photo-micrographic negative may require some little preparation before it is ready to print. For instance, diatoms being, as a rule, very transparent objects, require a short exposure. This exposure, though sufficient to bring out the detail in the diatom, is not long enough to give proper density to the background, which should appear white in the finished print. In this case the best plan is to "paint out" the background, at the back of the negative, with Bates' or Fallowfield's black varnish. It will be easy to follow with the brush the regular outlines of the diatom; but should any varnish trespass on the edges, don't wipe it off, but let the whole dry. When dry, hold the negative up to the light, and go round the edges of the image with a fine-pointed penknife, cutting away in an even manner any varnish that intrudes on the edge of the picture. The varnish should come exactly up to the edge of the image; there should be no intervening space, or failure will ensue. The negatives treated thus should always be printed in the shade—a powerful light would produce an objectionable black halo round the object. All objects which have regular outlines should be thus treated, if necessary.

The *Arachnoisdiscus* figured above had an exposure of fifteen minutes, with Swift's low-angle $\frac{1}{5}$-inch eye-piece and small microscope lamp. This exposure brought out the diatom sharply and with due printing density, but the background was weak, and would have printed in with a most objectionable blackness had not the plan of "painting out" been practised.

Parts which come out insufficiently dense, may be

strengthened on the film side of the negative with a soft blacklead pencil. This is best done after the negative has been varnished, using a little turpentine to roughen the part to which the pencil is to be applied.



ARACHNOIDISCUS INDICUS × 300.

Local reduction has often to be effected, and can easily be done by using the ferricyanide reducer given above. Wet the negative thoroughly; when the excess of water has drained off, dip a fine brush in the solution, and apply to the over-dense parts. As each dense place is reduced, dip the negative in water to stop the reducing action, and proceed with the next part.

It will often be found that, no matter what skill may be expended on the negative in strengthening weak parts and reducing dense ones, it is impossible to get a harmonious print. Some parts will print in strongly long before other parts are done, and no choice seems to be left but to underprint some portions, and over-print others. In this case, good prints may generally be obtained by the judicious application of cotton-wool. When the quick-printing portions are done, cover them with cotton-wool, place the printing-frame in the sun, and print in the denser parts as quickly as possible. In the finished print there should be no mark left by the wool, but all should appear as if printed in at the same time. The writer once photographed a section—transverse—of hazel, which was thicker one side than the other. As the negative showed splendid detail, he did not like to destroy it, but made use of cotton-wool, covering the weak part, corresponding to the thicker side of the section, with cotton-wool as soon as sufficiently printed, and leaving the dense part, which corresponded to the thinner side, to print further in a strong light. In the finished print there was not the slightest indication of the unequal density of the negative.

Very dense negatives should always be printed in strong sunlight; but as such negatives always give harsh prints, they should always be reduced to a proper density by the ferricyanide reducer. Some, however, are not injured by excessive density. The density that would ruin a portrait or landscape negative may pass unnoticed in a photo-micrograph, or, perhaps, be even an improvement. The chief objection to dense photo-micrographs is that they print very slowly, but in the majority of cases this will be no serious defect. The figure of a spider's head, given below, is from a very dense negative, which prints very slowly, but otherwise is satisfactory.

Thin, delicate negatives should be printed in the shade. The application of matt-varnish or tissue paper to the back of the negative will frequently improve the quality of the print. As a rule, all negatives should be printed somewhat deeper than is required in the finished picture.

HEAD AND JAWS, GARDEN SPIDER.

For toning prints on ready-sensitized paper, the borax or tungstate toning baths will be found the best. The formula for the borax bath is as follows:—

Solution of borax...	8 ounces
Solution of gold chloride ...	1 ounce

The borax solution is made by dissolving 1 ounce of borax in 80 ounces of water. For the gold solution, break a 15-grain tube of chloride of gold in a bottle, and add 15 ounces of water. Each ounce of water will contain 1 grain of chloride of gold.

For photo-micrographs which look best toned a black tint, the tungstate bath is very suitable. The formula is as follows:—

Chloride of gold	1 grain
Tungstate of soda	20 grains
Boiling water	8 ounces

To be used when cold.

Many other toning formulæ are used, but the writer has found those given above answer best the requirements of the photo-micrographer.

Before toning, the prints must be washed, either in running water or in several changes of water, to remove all traces of free silver nitrate. A quarter of an hour's washing is not too long. The toning dish should be a large shallow dish of ebonite or porcelain, capable of holding several prints *side by side*—not over each other in layers. Place the prints in the toning bath, and gently rock the dish. They will gradually change colour, and when they become of the exact colour required, remove them to a basin of clean water.

When all are toned, and *when all the dishes and solutions used in toning are put away*, to avoid all possible contamination by the hyposulphite of soda, the prints are transferred to the fixing bath:—

Hyposulphite of soda	4 ounces
Water	20 ,,

The fixing solution should be prepared shortly before use,

and 1 drachm of liquor ammoniæ added to each pint, to neutralise the acidity of the hyposulphite. If the ammonia be not added, the prints, after fixing, frequently appear of a sickly yellow, instead of a good purple or black.

The prints should remain in the fixing-bath from ten to fifteen minutes, and the dish should be rocked all the time to prevent the prints sticking together. They are next transferred to a basin or tub, and washed for two hours in running water. After this they may be placed between sheets of clean blotting-paper. When the excess of water has been absorbed, they should be ironed between dry blotting-paper until quite dry, when a further ironing on the face and back of the print with a very hot box-iron will improve its appearance. If the photo-micrographer have a rolling-press, the ironing may be omitted.

The writer has a frame of prints treated as above, which has been exposed to damp and strong sunlight during three years in a glass-roofed hall, yet no trace of fading can be detected in any one of the prints.

Some subjects, such as diatoms, have a far more delicate and natural appearance if enamelled either with plain collodion, or with collodion and gelatine. Full details of this simple process will be found in "Enamelling and Retouching," and "Silver Printing," published by Messrs. Piper and Carter. The photo-micrographer who wishes to excel in his art will find both works simply invaluable.

Our next three or four lessons will be devoted to the consideration of "Preparing Objects specially for Photo-micrography.

NOTES FROM NEW YORK.

Mr. Henderson in New York—Experiments with Gelatine Emulsions—An Explanation of One Cause of Transparent Spots on Gelatine Plates.

On the 9th inst. the Society of Amateur Photographers had the unexpected privilege of seeing and listening to Mr. A. L. Henderson, of London, and one of your most indefatigable workers in the chemistry of photography. Unfortunately, at the time he was here, the weather was extraordinarily hot and oppressive. Notwithstanding this drawback, his appearance attracted a large audience, including several prominent dry-plate manufacturers. Many of those present had never seen a gelatine emulsion made, and to them the demonstration was specially interesting and instructive.

Mr. Henderson's remarks were confined mostly to his process of cold emulsification and precipitation with alcohol, to show that by its ease of manipulation it was well adapted for use by the amateur. He was probably surprised to find how few amateurs there were here who made their own emulsions and plates.

On a temperature at 90° F., it was difficult to get the thermometer low enough to test the temperature of some of the solutions, and a curious part of the experiment was the necessity of rearing the thermometer on ice to make the mercury fall. I doubt whether Mr. Henderson had ever had occasion to make an emulsion in such a warm atmosphere.

One gentleman suggested the idea of injecting bromine vapour into a solution of nitrate of silver. Mr. Henderson had not heard of any experiments in that line.

Another gentleman related an experiment which involved the idea of suspending metallic silver in a finely-divided state in a warm solution of gelatine, and subjecting it to the fumes of bromine, which were made to pass through the solution. The bromine converted the exterior surface of each fine particle of silver into a bromide having a centre of pure silver.

Mr. Henderson was elected an honorary member of the Society, and a vote of thanks was passed to him for his kindness in explaining his process. A statement which he made, that he had tried not less than ten thousand experiments on making emulsions, gave authority to the conclusions which he had arrived at.

Owing to the dryness of our atmosphere at certain times during the summer months, manufacturers of dry plates have experienced difficulty in thoroughly drying their plates on a large scale. Several have gone to a large expense in constructing special apparatus, by which immense volumes of dry air are passed over several hundred plates at a time, thereby drying them completely within two hours, where it formerly took twelve to fifteen hours.

Another manufacturer, after many experiments, has discovered a new cause of pinholes in gelatine plates. He took a plate freshly coated in a wet state, and exposed it in the camera; a perfect negative resulted. He then tried another plate coated with the same emulsion, and when dried exposed it in the camera. When developed, it was full of minute pinholes. He then examined the action of the gelatine film as it dried under the microscope, and to his surprise found something from the surrounding air entered the film. His theory was, that minute spores floating in the air attached to the moist film, and when in contact, combined with the acid in the film and produced a vapour, which, during the drying, dilated the gelatine, making the transparent spot. There was no solid centre to the spot like that noticed in spots produced from some foreign substance in the film. He overcame the difficulty by surcharging the atmosphere in the drying room with some poisonous gas, poisonous to the spores, but not to human life; after that no spores occurred.

The sudden collapse of the new journal, *Photography*, published at Chicago, leaves the weekly, called *The Photographic Eye*, in full sway.

The field excursion to Manck Church of the Amateur Photographers, which was to have been held on the 10th, was postponed to the 24th inst. on account of the excessively hot weather.

I am told the manufacture and consumption of dry plates in this country has now reached enormous proportions.

New York, Sept. 17. The Amateur Photographer.

THE POTASH DEVELOPER.

BY FRANCIS COBB.

As I know you like to collate experiences, I send you mine. The first thing that struck me was, that the component salts were to be "chemically pure." I went to a well-known pharmaceutical compiler of mixtures, and said, "Can you supply me with some carbonate of potash?" "Certainly." "I want that," said I, putting the symbols before him—$K_2.CO_3$ "Oh, ah! if you require that, you had better go to ——," naming another chemist.

I went to ——'s, and the same preliminary was gone through; the production of the symbols raised the price of the carbonate just three hundred per cent., so that by the time I had collected my pure chemicals the developer looked rather an expensive one. The results of developing with the potash pleased me very much, and with proper exposures three—if not four—plates can be developed, the developer keeping clear all the time. But with instantaneous shutter work I did not find it as useful as the old ammonia process. On one occasion, with a quarter of a second exposure, it came to a stop, and I added dose after dose of the potash without moving it. I then dropped one drop of ammonia into the developer, and it started and gave density directly.

On one occasion I found myself with a potash developer that had developed three plates, and a pyro ammonia developer that had developed one plate. I had one more plate to develop, and no fresh mixture ready, so I mixed the two old developers, and the only fault that I have with that plate is, that it is too dense. I have repeated this unscientific process since, with equally good results. The one drop of ammonia works wonders; but this one

drop is the fly in the apothecary's ointment—it is a drop too much. We want to do away with ammonia, and do without "one drop." But when I have an extra sparkle in my potash developer, I think it is due to the "one drop" of our old enemy—ammonia.

Notes.

Another picture from Messrs. David and Scolik's series forms our supplement this week. The Emperor of Austria, walking bare-headed, is distinctly recognizable.

Workers with the soda developer complain of the difficulty of obtaining constant results, and they will have frequent cause of complaint as long as they use the common washing soda crystals obtained from the chandler's shop.

Washing soda should consist of the normal carbonate, Na_2CO_3, united with ten molecules of water of crystallization; or 106 parts of the carbonate and 180 of water. That is to say, the crystals should contain 37 per cent. of carbonate; but, as a matter of fact, nearly one-third of the 37 per cent. is often sulphate of soda.

The best way is to purchase the dried pure carbonate of soda, which is sold semi-wholesale by large dealers in chemicals at from 7d. to 8d. per pound; this containing about 97 per cent. of the carbonate of soda.

The salt ordinarily sold as "carbonate" by druggists, and used occasionally for making tea dark-coloured, is a sodium-hydrogen carbonate containing $NaHCO_3$, and this compound is often called bicarbonate of soda.

A contemporary is making a very strange photographic collection. It is, gradually filling an album with the cartes of men who are well-known "prowlers," a term which is defined to mean "men who make it the occupation of their lives to insult and annoy unprotected women." Already, it would seem, the likenesses of eight well-known "prowlers" have been received with accompanying "startling revelations," and in due time it is intended to publish the entire collection grouped in a cartoon. But how about the law of libel?

An honest, simple-minded photographer of our acquaintance can't make out why Alderman Nottage, the Lord Mayor-elect, should be described as "citizen and carpenter!" He says:—"Had it been cabinet maker, I shouldn't have been surprised, because making cameras and all that would come under this heading; but 'carpenter'—no, it beats me."

Very civic, indeed, were the remarks made by the Mayor-elect at the Common Hall on Monday. Doubtless he felt himself constrained to offer incense to Gog and Magog.

These are Mr. Alderman Nottage's views. The right of the Livery Companies to their property is as indubitable as that of any private person to his. Some people take a delight in calumniating the City Guilds. Civil Service stores must be endured until a remedy is found; but, in the meantime, it would be as well to exercise *an influence* on such tradesmen as affiliate themselves to these Stores; still, civil liberty must be defended to the utmost. Foreign philosophers will ruin the City if they are allowed to interfere with the practical business men now in power.

The revolving show-case forms just now a feature in the reception-rooms and windows of photographic establishments in the States. A case with three revolving cylinders, each of which supports twenty-five cabinets, costs forty-eight dollars, this price including the spring motor; while a one-cylinder case will conveniently fill up an odd corner.

A photographic novelty is announced in the shape of a new ornament for the wedding-breakfast table. This consists of the photographs of the bride and bridegroom enclosed in a block of transparent ice, one on either side. The effect is said to be very pretty; but is not the position of the portraits rather suggestive of an undoubted coolness between the newly-married pair?

That most samples of water contain traces of alcohol has been abundantly proved; and Professor W. N. Hartley, in his recent Cantor lectures on "Fermentation," gave interesting details.

Sea water, river water, and rain water are invariably alcoholic; the water of the river Seine, for example, containing one part in a million by weight, or a gramme in a cubic meter—let us say half a teaspoonful in an ordinary street watering-cart full. Spring water is often free from alcohol, but surface soils always contain it. To sum up, alcohol is a nearly constant product of the natural disintegration of organic matters.

As a test for the presence of alcohol in the distillate of any substance, Professor Hartley recommends the addition of iodine, and then sufficient caustic potash to destroy the dark colour. On gently heating the liquid, yellow shining crystals of iodoform are deposited if alcohol was present, these being easily identified by microscopic examination.

A new field is proposed for the operations of the "instantaneous photographer"—viz, the interior of a fashionable Turkish bath during the height of the season. A scene depicting the shampooing of famous statesmen, well-known dramatists, popular authors, aristocratic actors, and social celebrities, &c., would certainly be a very amusing one. Even the most severely solemn of our judges would find it difficult to appear in such a picture with dignity, and devoted adherents of Episcopism have been known to entertain altered views of the Apostolic succession of bishops after meeting a Right Reverend Father of the Church in a Hummums.

The Prince of Wales was photographed nine times last week, the greater part of the negatives having been taken in connection with the deer stalking operation in which H.R.H. engaged. Copies of all these likenesses—and, in fact, of all that are taken from time to time of any member of the Royal Family—are sent to her Majesty, one of whose personal attendants has the custody and arrangement of all such photographs. This duty, as may be imagined, is no sinecure. The accumulation of cartes, cabinets &c., is enormous; and the albums in which they are arranged form quite a library of themselves. A new album has lately been added to the list: it is to be devoted to the portraits of her Majesty's great grandchildren.

The Liverpool Amateur Association institutes a competition for the best series of six photographs taken by a non-professional photographer within a radius of ten miles of Liverpool; but instead of giving a mere certificate of honour as a prize, they offer two of their presentation prints, framed and glazed—an excellent idea, as few persons know what to do with a certificate of honour, while anyone can find wall space for a good photograph already framed.

Tannic acid, gallic acid, and pyrogallic acid may, according to Nasse, be distinguished from most analogous substances by the fact that they give a transient purple colouration with iodine in an aqueous solution.

The faint hope of picking up a long-lost treasure is doubtless the motive which actuates many a lounger in the auctionr-room. Few, however, can hope to get what Mr. T. C. Robinson says he got for a few shillings at the sale of the Fountaine collection—nothing less than an original drawing by Michel Angelo.

Mr. J. Glaisher, F.R.S., when presiding at the half-yearly meeting of Harrow District Gas Company on Wednesday last, told the shareholders that even in the United States, where gas costs from eight to ten shillings per thousand feet, it can hold its own against the electric light.

"Each letter I receive is accompanied by some four or five photographs, and these really give me far more information than the letters themselves."

This remark was made by a friend of ours who possesses an orange plantation far distant from his present abode; indeed, as far as the New World is from the Old. Still, with the eye of the camera he can see across a gap of several thousand miles, but he sees things as they were about a fortnight previously.

Who knows but what the time may come when it may be practicable to send a photographic representation by cable, a feat which, at the present state of science, is just possible, but certainly very, very far from practicable, owing to the enormous cost of the requisite apparatus, and the extreme slowness with which the transmission could be effected.

Hitherto photographs of the heavenly bodies have been held to be superior to drawings by hand. Professor Langley, however, in his interesting paper in last month's *Century* entitled "The New Astronomy," contends that in one instance at least photography fails. This is in regard to sun spots. The method adopted at Alleghany Observatory is to project the image of the sun through the 13-inch equitorial on to a sheet of paper, and increase the size of the disc by the use of various lenses. The outlines having been traced, a polarising eye-piece is fitted to the telescope, and the surface of the sun examined with the eye for the details of the spots which are drawn within the outlines already traced. Professor Langley says a photograph would give simply a black umbral space within the outline; the details being lost.

If the Society of Amateur Photographers of New York does not foster and develop the true spirit of photographic research in the United States, we shall be surprised. Experimental photography in America has up to now been much hampered by patents; and as the tendency of those reading papers before the societies has been to try how little information they could give, and how much they could learn, one cannot help feeling gratified at the success of a Society in which this business element is altogether absent.

An excellent rule of the Amateur Association is, that any office-bearer or committee-man who shall neglect his post for three months is *de facto* un-officered.

A correspondent who has been attending the meeting of the American Association at Philadelphia tells us that the most interesting matter in connection with photography brought out at the meeting had reference to Mr. Muybridge's pictures. Mr. Muybridge demonstrated the working of his apparatus in the Philadelphian Zoological Gardens, various animals being caused to walk or run (and, in the case of birds, to fly) before the battery of cameras. Our correspondent declines to express any opinion as to whether the exposures were "dummy" ones; but anyhow, the shutters were fired off, and whether or no there were any plates in the cameras is a matter for Mr. Muybridge alone. We are glad to learn that by the use of gelatine plates much finer results have been attained than the silhouettes of galloping horses now so well known. The full details of the figure, even in the shades, are given in the latest negatives obtained.

The same correspondent remarks that, as far as he can ascertain, just 38·5 per cent. of the members of the British Association took cameras with them to Montreal. Outside of Hampstead Heath on a Bank Holiday he never saw so many cameras in the field at once, but he hints that some of these enthusiastic amateurs did not quite seem to have proper control over the legs of the tripod; but this insinuation of his we attribute to ill-nature and spite, as we know he did not take his own apparatus.

In a postscript, our correspondent adds that he does not

mean to include Mr. York in his list of those who got mixed up uncomfortably with their tripods. To see the deft way in which that worthy gentleman leapt from the train during a momentary stoppage, and secured his first view of Niagara, should have taught a lesson to the rest of the company.

Patent Intelligence.

Applications for Letters Patent.

12,772. Fox Shew, 23, Southampton Buildings, Middlesex, for "Improvements in means for increasing the usefulness of photographic cameras."—Dated 24th September, 1884.

12,855 William Watts, 41, John Dalton Street, Manchester, for "Improvements in camera tripods or supports."—Dated 27th September, 1884.

Patent Sealed.

8643. Benjamin Joseph Edwards, 6, The Grove, Hackney, Middlesex, Photographer, for "Improved apparatus for coating photographic plates or paper with gelatine emulsion." Dated 5th June, 1884.

Specification Published during the Week.

10,950. Alexander Henry Reed, of 90, Cannon Street, in the City of London, for "Certain improvements in photographic cameras."—Dated 5th August, 1884. (*Complete Specification.*) This invention has already been described and figured in the Photographic News, present volume, page 460.

THE USE OF THE ROYAL ARMS.

On Tuesday last, the 30th ultimo, Messrs. A. and G. Taylor, photographers, of Regent Street and elsewhere, were summoned at the Great Marlborough Police Court for using the Royal Arms without authority. The summons was taken out by Mr. W. Turner, photographer, of 140, Upper Kennington Lane, and the case was based upon the 106th section of the new Patent Act, which came into force at the beginning of the present year. The clause in question makes it penal to use the Royal Arms for business purposes without authority from a member of the Royal Family or a Government Department.

Mr. Bateson, solicitor, who opened the case against Messrs. Taylor, read a letter which he had received from the Lord Chamberlain's Office, in which it was stated that Messrs. Taylor held no warrant of appointment as photographers to the Queen, but on reference to the Act it was not found that a warrant of appointment was mentioned as being necessary; and Mr. St. John Wontner, who appeared for Messrs. Taylor, contended that even if the letter from the Lord Chamberlain's Office could be regarded as evidence, it would have no bearing on the case; he also contended that his clients actually had authority to act as they had done, this authority being virtually given by repeated commissions executed for the Royal Family, and in virtue of orders given by the various members individually, one of the partners in the firm being an old retainer on the Balmoral Estate.

The only evidence called by the prosecution was that of W. Simkins, who had been for a short time in the employment of Messrs. Taylor as a traveller. The witness stated that he had circulated prospectuses for the defendants which bore the Royal Arms, and that the defendants displayed the Royal Arms in front of their premises. Mr. Wontner handed the witness a cabinet card issued by Messrs. Taylor, and asked him to state whether the Royal Arms were printed on the back, and he immediately answered in the affirmative. The magistrate, however, could not detect the Arms in question, as it appeared to him that the only device on the card consisted of a crown and coronet; and he expressed himself as by no means satisfied that the witness possessed a sufficient knowledge of heraldry to make his evidence valuable.

No more witnesses were called, and the magistrate, in commenting on the difficulty of proving that the defendants possessed no such authority as was required by the 106th clause in the new Patent Act, pointed out that the plaintiff's case could only be thoroughly made out by putting in evidence to the effect that no authority had been given by any member of the Royal Family, or any Government Department, a course altogether impracticable; he consequently felt inclined to rule that the burden of proof should rest upon the defendants.

Mr. Wontner argued against this, it being contrary to usage to throw the burden of proof upon the defendants in a penal case; notwithstanding this, he would have no difficulty in proving that his client acted under sufficient authority. He also again remarked that even under the new Act he did not see that a written warrant of appointment was by any means necessary.

The case was then adjourned until Tuesday, the 7th instant, it being understood that evidence would be given on behalf of the prosecution by someone from the Lord Chamberlain's Office, and by heraldic experts, after which Messrs. Taylor would be able to call their witnesses.

MY STUDIO.

How I Let It and How I was Let In.

He was a pale-faced sickly little man, certainly not more than four feet in height. She—from the little difference apparent in their ages, she might either have been his wife or his mother—was a shade taller, say four feet one inch. Both were shabby, decidedly shabby, and yet had the appearance of having on their Sunday clothes. They came into the room in an apologetic kind of way, and when I asked them to be seated, sat down gratefully and humbly.

"You have advertised a studio, I think," said the small man, in the meekest of voices.

Yes, I had. I had also advertised apparatus, for which I wanted £35. By their looks the—well, I will call them the Midgets—did not appear to have thirty-five pence.

"I am afraid the place will not suit you," said I, benevolently. "It needs capital to enable you to wait while you are forming your connection. Then— "

"Oh, I shouldn't think of depending on the portrait business," said the male Midget.

"Oh, dear no. You see, sir, he"—the female Midget always spoke of the male in the third person—"he's a photographic printer."

"Yes, I print for the trade," chimed in the little man.

I reflected. Yes, it did make a difference. I had never to my knowledge seen a photographic printer, and perhaps it was only in the nature of things that he should be attired in a suit of rusty seedy black.

"But what about the apparatus?" said I.

"Oh, we will buy that; we will give you a bill at three months," said the male.

"Yes, he will give you a bill at three months," said the female; "I have a little money coming in then."

What could be more satisfactory? They were shabby, it is true, but then millionnaires sometimes wear bad hats. Besides, how reassuring was their quiet, placid, respectful, almost timid manner. No blustering, no bumptiousness, no demanding this or that condition, no haggling over terms. Really I was in luck at last. Still, such guileless simplicity needed protecting, and I was not the one to take advantage of it.

"But," I objected, "you have not seen the studio yet."

"When," hesitated the male, "could I—"

"Yes, sir," added the female, "when could he see the place?"

I named a day, made an appointment, and, after many apologies for taking up my time, the Midgets withdrew.

Never were two people more delighted with anything than were the Midgets over the studio.

"Oh, ve-ry nice," said the small man to every remark of mine pointing out the best qualities of the place.

"It's in capital order; had it repainted, you see."

"Oh, ve-ry nice."

"Roof overhauled and well puttied."

"Oh, ve-ry nice."

"Pretty well a new floor laid down where the planks were rotten."

"Ve-ry nice indeed."

"Fine large garden."

"Yes, I wanted a large garden. I print for the trade, you know"—in a dreamy voice, as though conning a lesson.

They took the studio at once, and not only at once, but for three years. I had references? Certainly. I did not see the referees personally, as a prudent landlord should have done, but then I had such faith in the Midgets.

They were to pay their rent monthly, and, sure enough, at the end of the first month came a letter. "Exemplary tenants!" I murmured; "they have sent a cheque," I was about to say, but it wasn't a cheque. It was a note apologizing for not sending the rent, as they had not been able to commence business owing to workmen being in the place; but next month they would pay up the arrear.

I was not quite so comfortable, still there was reason in the excuse. I would wait till the next month.

Before the time arrived, a visitor called upon me. He was a British working man. The working man, as generally drawn, is a broad-shouldered individual in a corduroy jacket. He has a square face, a bushy fringe of whiskers, and curly hair. If artists had detective cameras and photographed the working man as he is, they would draw him undersized, with not much hair on his face, and wearing anything but corduroy. My working man was a specimen of this type.

He came in softly, shut the door mysteriously, and, in a whisper which curdled my blood, said: "Wot sort o' people have you got in your place at ——, Guv'nor?"

"What sort of people? Very decent people, of course. They're not much to look at ("They ain't that!" ejaculated the W. M.), but I believe they're thoroughly respectable."

I really felt quite indignant that any doubt should be cast upon the respectability of the Midgets, and was quite prepared to be their champion.

"Well, all I know is that I've been doing ten or twelve pounds' worth o' work for 'em, and can't get a smell o' their money. Why, they can't even pay the deposit for the gas meter, and the Company won't put the gas on."

This looked bad. Still, I clung desperately to the Midgets' respectability. There was something in their very smallness which was reassuring. Two such diminutive people could not possibly be swindlers.

I argued in their favour with the W. M., and sent him away sad, but slightly comforted.

"I will go and see the Midgets, nevertheless," I thought.

I went. The studio door was open, and I saw the male Midget reclining peacefully in the posing chair. He had on a dirty red cap of the fez pattern, and he looked sicklier than ever.

I put on a business-like air.

"Well, Mr. Midget, what about this rent coming due?"

"Oh, you shall be paid," said he, placidly.

"It looks bad, you know, not to be able to pay your first month's rent."

"Oh yes, it does look very bad," more placidly than ever.

What could be said to a man who owned his transgressions so readily? I could say nothing, and left—but not before I had peeped into his dwelling rooms. His *menage* was not inspiriting. Ten shillings at the very outside would have purchased the whole of his furniture, and I had let this microscopic mortal my studio and house for three years! No, I was not comfortable.

I was visited again by the W. M. "Guv'nor," said he, I dunno what to make o' that little lot. They're in debt all over the place. They've got credit out of a neighbour o' mine to two pounds. It's my belief they ain't got a penny to bless theirselves with. I don't say as he don't do no work, for he's always a begging my men to give him a morsel o' paint or a bit o' wood, and then he tinkers away at it; but what he does with it I don't know. I never come near sich a queer card."

I could not comfort the W. M. this time; I wanted comforting myself. The second month expired, but no cheque arrived. Again I visited the studio, and found Mr. Midget in the garden contemplating a solitary quarter-plate printing-frame.

"Well, Mr. Midget, I have not received the two months' rent as you promised. This won't do, you know."

"Oh, no," said he, more placidly than before; "it will never do. But I got an order last night, and I'm executing it"—pointing complacently to the quarter-plate printing-frame.

"Good Heavens! do you mean to tell me you are going to pay me eight pounds on the proceeds of the order?"

"Oh, I expect to get other orders. You shall be paid every farthing!" and he gazed plaintively at the chimney-pots on the house next door. I confess I lost patience then.

"Mr. Midget, if you are not a swindler, you are behaving in a manner to make me believe you are one. You call yourself a photographic printer: where is the evidence of it? Where are your printing-frames?

He was quite undisturbed.

"That is one," he remarked.

"One!" I repeated, with all the emphasis which could be placed on the word. "But if you print for the trade, you ought to have not one printing-frame, but a hundred."

"Oh, yes," said Mrs. Midget, coming up at this moment; "so he had, but he lent them to a friend."

Lent them to a friend! Lent his stock-in-trade, by which he hoped to gain his livelihood and pay his rent, to a friend! Did anyone ever hear of such self-sacrifice?

"Mr. Midget," said I, sternly, "I don't believe you. To-day is Friday: if you have not the two months' rent ready by Monday, I must put the brokers in." And with that I left him still contemplating the quarter-plate frame, perfectly undisturbed.

But it is one thing to put the brokers into a house, and another to get out a tenant to whom you have granted a three years' agreement. On reflection it occurred to me, in view of the "sticks" which Mr. Midget called his furniture, that I should get no further by putting in a broker. Had the apparatus been the tenant's the case would have been altered; but it was mine, and I couldn't seize my own property, which, by the way, he could still use, for hadn't I sold it to him for a three months' bill, and there was a month yet to run?

In a word, I was "cornered," and I went and consulted the W. M., whom I found anxiously curious as to how I had got on.

"Well," said he, "we're in a pretty mess, you with your rent, and me with my £12 worth of work. I don't see no good in putting in the brokers. I tell you what, though," he added, suddenly, "we might go and see my solicitor. He's a reglar sharp 'un, he is. I'd sooner take his opinion than a whole bench of judges. Why, he's the man who seized a tramcar on a writ of eligeit; seized her as she was running, sir."

I was overcome with this example of sharpness, and, being heartily sick of the affair, clutched at the straw. My reviving spirits were dashed somewhat when the W. M. proceeded to say that his solicitor had been "struck off the rolls," and that we should most likely find him in the public-house; but I hoped for the best.

The W. M.'s prognostigatiou was correct. We did find the solicitor in the public-house, and after a "refresher" in the shape of a pint of stout-and-bitter, the legal luminary proceeded to lay down the law. I am bound to say he took rather a gloomy view of the case when I had explained it to him, and was inclined to the opinion that Mr. Midget was "one of that class of swindlers, sir, who take houses with nothing worth seizing, and you have to pay them to go out. I can see this man's game, sir—he wants £5 to go."

This was pleasant, and the worst of it was, it seemed to describe accurately the state of affairs.

All at once a bright idea seized me.

"Look here; why shouldn't I proceed against this man for obtaining these premises under false pretences? He represented to me that he printed for the trade, and in the faith of that representation I let him the house. Now he doesn't print for the trade; at least, there's no evidence of it."

"That's a good notion," said the solicitor, approvingly. "Shall I go with you—as a friend, you know—and see what this man has to say for himself?"

I accepted the offer, and we at once set out with this arrangement, that the W. M. should drop in "promiscuslike" afterwards.

Nothing seemed to astonish Mr. Midget, and he received us quite calmly. However, when I informed him that on thinking over the matter, I had come to the conclusion that he had rendered himself liable to a criminal prosecution, he was rather startled. The solicitor held his peace while I stated my views and heard what the Midgets (the mother still kept up her character of spokeswoman) had to say in reply, which wasn't much. In fact, they could say nothing. Then stepped in the solicitor, always purely in a friendly way, as he explained, and solemnly warned the Midgets what in his opinion, after thirty years of police court practice, would happen. Having thoroughly alarmed them, he cooled down and represented that I—overflowing as I was with kindness—did not wish to do anything harsh. "Have I," said he, turning to me, "your permission to make a proposition?"

"Certainly;" and as, in walking to the house, we had agreed he should make this proposition, I was quite prepared to hear it.

"Well, my proposition is this: will you, Mr. Midget, go out at once, give up possession, and cancel the agreement, if the landlord forgives you the two months' rent?"

Most people under the circumstances would, I fancy, have closed with this offer at once; but not so the Midgets. They, on the contrary, thought it was very hard, just as they had found a place which suited them, to be obliged to go. Finally, however, they accepted the proposition, but only under a threat of my at once going before a magistrate; and it was with great reluctance they produced the agreement, which I need not say I had at once destroyed.

Even to the last they kept up the deception. In the very act of delivering up the key, Mr. Midget—as though nothing had happened—said, "Perhaps I may be able to buy the apparatus in about a month's time. I suppose you would have no objection to sell it to me?"

I forbear repeating my reply. It was not an approval of the Midget's cool unblushing effrontery.

PHOTO-LITHOGRAPHY AND PHOTO-ZINCOGRAPHY.

BY MAJOR J. WATERHOUSE, B.S.C.,
Assistant Surveyor-General of India.

Chapter XVII.—Miscellaneous Processes—(*continued*).

Various methods of working with the salts of iron dependent on Poitevin's discovery of the reactions of a mixture of perchloride of iron and tartaric acid under the influence of light are applicable to photo-lithography, but beyond the fact that the effects produced by the action of light are the exact converse of those produced in the collo-chromate processes, these methods appear to have no special advantage over the latter.

Sensitive films of gelatine prepared with the perchloride of iron and tartaric acid have the property of becoming deliquescent and soluble under the action of light. Therefore, if a roller charged with greasy ink be passed over such a film after exposure to light, the ink will only take on the parts preserved from the light, and in the proportion to the extent of the protection.

The image thus produced will be of the same character as the cliché—positive from a positive, negative from a negative. If, however, instead of the image being rolled up with transfer ink, a brush charged with a very fine resinous or lithographic ink powder be passed over it, the powder will only attach itself to the parts affected by the light, producing an image the reverse of the cliché, and capable of being transferred to stone or zinc.

The sensitive paper for the transfer process above noted may be prepared by immersing slightly gelatinized paper in a solution of

Perchloride of iron	10 parts
Tartaric acid	3 ,,
Water	100 part

and allowing it to dry.

Liebert, *Photographie en Amerique*, gives the following method, which is equally applicable to stone. Thick glasses finely ground on one side are thoroughly cleaned, then covered with a coating of gelatine at ten or fifteen per cent. of water, and dried in a warm chamber free from dust. The day before the plates are required, they are sensitized by immersing them for one or two minutes in a bath of

Water	100 parts
Perchloride of iron	3 ,,
Tartaric acid	1 ,,

They are then left to dry in the dark. The exposure to light is made under a positive on glass or transparent paper. After exposure the glasses must be well soaked in water to remove all the iron salts. They are then rolled in with printing ink, which takes only on the parts that have been protected from light and have retained their insolubility.

This process has the advantage that the underlying coat of gelatine in contact with the stone or glass, instead of being soluble, and therefore liable to be removed by the washing and wear and tear of printing, is insoluble, and no sunning at the back or preliminary coatings are required.

In 1878 M. Poiteven published another mode of working, dependent on a discovery he had made that gelatine rendered insoluble by perchloride of iron and tartaric acid became soluble again by treatment with dilute acids, and thus he was able to obtain positive prints in fatty ink from negatives, and such prints could be transferred to stone or metal to be printed or engraved.

His method of proceeding is as follows:—Paper coated on one side only with gelatine, lightly coloured to enable the operations to be better followed, is sensitized by floating both sides successively, or plunging it for some minutes into a bath of

Perchloride of iron...	10 parts
Tartaric acid	3 ,,
Water	100 ,,

and letting it dry in the dark. When dry it is exposed for some minutes in the sun under a negative. The exposed surface is then treated with warm water, which dissolves all the parts that have been acted on by light, and thus a negative print of the drawing is obtained, the transparent parts of the negative being formed by the white paper laid bare

After a sufficient washing, the sheet is left to dry, and then covered all over with fatty ink by means of a roller or pad, or better, in the press. The inked print is next plunged into water slightly acidulated with hydrochloric acid, and then into warm water, which dissolves the gelatine and takes with it the coating of greasy ink, while the ink in contact with the paper remains and forms a positive print in greasy ink, which can be transferred to stone or zinc in the usual way.

Dr. Liesegang has suggested the use of Pelouze's salt for making what may be called negative transfers, the fatty ink taking on the parts protected from the light, instead of on those exposed to the light as usual. He made a solution of bichromate of potash in hydrochloric acid, and floated albumenized paper upon it (albumenized side up-

wards) until the albumenized film became of a uniform yellow colour. The paper so prepared was not more sensitive than that prepared with biehromate of ammonia, but upon treating the exposed inked print with warm water, to remove the ink from the non-exposed parts, a negative image was obtained.

Dr. Eder has lately published the fact that a solution of ferrid-cyanide of potassium renders gelatine insoluble, the solubility being restored under the influence of light in the same manner as when treated with perchloride of iron and tartaric acid. Investigation would probably result in the discovery of similar reactions with other salts of iron, which might be turned to useful account in these processes.

AN EASY METHOD OF COLOURING CARBON TRANSPARENCIES AND PHOTOGRAPHIC CARDS.

BY E. EDWARDS.

The method which I am about to describe requires very little practice to become proficient in it, and can be used by anybody. The colours which are used in this method are excellent for colouring photographs, and also for canvasine painting, an account of which was given in No. 1358 (September 12th, p. 578) of this journal; it will, therefore, be unnecessary to give the details of canvasine as the only difference in the working is, that the print must be coloured before the canvas effect is fixed.

The first thing to be done is to prepare the paints. Get from any wholesale chemist a small quantity of different aniline colours or dyes, and dissolve them separately in spirits of wine, gradually adding the spirit until all is dissolved; dilute by about its own bulk of water, and add ox-gall until the colours flow smoothly from a camel-hair brush over glazed paper; when this has been attained, the colours are ready for use, and the painting may be commenced. It is advisable for the beginner to commence with a portion of the transparency which has the smallest surface of the same colour, as it requires a little practice to lay on an even coat on a large surface, such as the sky or sea. If the colour is piled on by degrees with dilute colour, it renders the laying on of a smoother coat much easier. It is as well to give the transparency a coat of varnish when the colouring is completed and quite dry. For colouring cards the colours should be laid on very dilute (especially the flesh colour), and should be laid on in successive washes until the desired colour has been attained. The colours most useful are—lemon-yellow, green, orange red, blue, violet.

For flesh colour—lemon-yellow and red.

For different shades of green—lemon-yellow and blue.

For lilac and purple—violet and red.

For jewellery and fair hair—orange.

The commonest water-colour brushes give as good an effect as the most expensive ones.

Correspondence.

FELLOWS OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

Dear Sir,—Excellent as is Mr. Emerson's suggestion that there should be some "distinction between ordinary members and masters in the art of photography," I beg to state that he is mistaken in stating that anyone, by payment of a certain fee, can become a member of the above Society." If Mr. Emerson will refer to the rules of the Society he will find in Law IX.: "Every candidate for admission into the Society must be proposed by two or more members, who must sign a certificate in recommendation of him, which must set forth the name, place of residence, and qualifications of the candidate, and state that he is desirous of becoming a member of the Society; and the proposer, whose name stands first upon the certificate, must have personal knowledge of the candidate." Of course, the above quotation does seriously interfere with the proposal to cast honours on the "masters in the art of photography." In addition, I would extend the proposed title to *our masters in the science of photography*, for there is no reason why those who improve and freely present the world with new powers should not be placed in the same position as those who make use of, and benefit by, their study.—Yours truly, A Member.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF IRELAND.

Sir,—Permit me, through the medium of your columns, to remind those who purpose sending pictures, &c., for exhibition, and who have not already intimated their intention of so doing, that the last day for receiving will be the 31st October. The form of entry, of which I shall be happy to supply copies, should be returned to me here, and the packing case addressed to care of Royal Hibernian Academy, Abbey Street, Dublin.

I may also mention that there is no charge for space; carriage of all packages for exhibition will be defrayed by the Society, the consignee paying that on return.—Yours truly, Greenwood Pim, Hon. Sec.

Monkstown, Co. Dublin, Sept. 27. Exhibition Committee.

NITRITES IN THE DEVELOPER.

Sir,—As the use of a sulphite in the developer is apparently, from the discussions at the meetings of our various societies, advocated by some, and none the less strongly condemned by others, one of the reasons for its being held in disfavour being its instability, and especially the difficulty of neutralizing an alkaline solution thereof by sulphurous acid, unless sometimes used in large quantities, would not a nitrite be free from at least the latter objection? I have not time to make the necessary experiments myself; but the following, which I tried some little time ago, led me by its results to hope for success, and encouraged me to suggest the matter to other gentlemen with more time and opportunity at their disposal.

Nitric acid was heated with a little starch, and the evolved gas passed through a saturated solution of potassic hydrate until a neutral liquid resulted. This was evaporated nearly to dryness, and a saturated solution of the salt made in water.

A drachm of this with four grains of pyro, and the usual amount of ammonia, bromide, and water, developed plates successfully free from stain, and bright, the solution meanwhile remaining as clear as when sulphite was used.—Yours &c., W. B. Allison.

USE OF SNUFF IN THE DARK-ROOM.

Sir,—Will you permit me to suggest to those who suffer from the inhalation of ammoniacal fumes a trial of my simple and, after a while, not unpleasant remedy? When first subjected (almost constantly by day) to the fumes of ammonia, I suffered much in the head and chest with frequent and severe attacks of influenza. My antidote was a well-filled snuff-box, and a frequent use of it while in the dark-room. The benefit has been marked, and one need not contract a habit of snuff-taking if the box be kept and left in the dark-room. The habit may remain a dark-room one, and no more, as it has done with me.—Yours truly, R. S. Freeman.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 25th ult., Mr. A. Haddon in the chair.

At the request of the Chairman, Mr. A. L. Henderson gave an interesting account of his visit to America, mentioning many details in connection with dry-plate photography there; especially the working arraugements of some of the larger factories. In the factory of Mr. J. Inglis, a slight modification of the cold emulsification process was at work, three batches each of ten gallons being precipitated with alcohol. After coating, the plates travelled by means of a twelve-horse power steam engine into a refrigerator containing two tons of ice; thence on racks capable of holding 200 12 by 10 plates, until 4,000 were coated. The steam power was also utilized for pumping filtered air into the drying-rooms, raising an elevator, and warming the establishment. The whole batch was perfectly dry in two hours. A contrivance used in packing at this factory was then shown by Mr. Henderson. It was a wooden tray sufficiently commodious to permit cardboard packing boxes 12 by 10, or any smaller sizes, to be clamped while being filled. Two parallel bars fixed on the top sides acted as guides to a horizontal bar, which travelled to and fro over the box supporting the free ends of two balls of string, which were secured to the box; adjustable clamps being used to regulate the proper distances between the two strings. The method of separating plates by string was suggested by Mr. Harrison, of London. Mr. Henderson then described a method of glass cleaning he had seen in operation, which was quick and effective. The plates, covered with whiting, were passed between two reels of paper, revolving at a high speed. In reply to questions, Mr. Hendersou said coatiug was done by hand in all the factories he visited. The gelatines employed were similar to those used in England. Regarding the general style and quality of work shown at the Cincinnati Convention, he said that, considering the short time gelatine plates have been in use in America, the results were astonishing; some large direct studies of children shown there could not be done in this country. Whether it was the superiority of the light, or the plates, he was not prepared to say. The Americans would have clear shadows; plates giving veil would immediately be rejected. Speaking of the New York Amateur Association, he said their arrangements were excellent. A room in which he demonstrated the precipitation process was capable of seating over two hundred; attached to this was a laboratory, fitted with lockers for each member, and suitably lit for photographic work during the day or evening. He also took occasion to say, in reference to the report of his remarks at the Convention, that the word "art" had been omitted, which conveyed the idea that he was not a photographer.

Mr. J. Weston (Boston, U.S.A.) passed round a series of composition pictures, including one of a numerous assembly engaged in skating at the Ice Palace built at Montreal last February; some very good exteriors of the Palace were also shown.

Mr. W. E. Craig showed some instantaneous negatives developed according to the formulæ described on page 485 of the present volume; the quality was considered excellent.

The Chairman exhibited three plates by the ammonia-nitrate process, which were of an interesting nature. The first had been exposed wet, and developed with ammonia; the negative then presented green fog by reflected light, and red by transmitted; by accident the plate was left in the hypo fixing bath for twenty-four hours, when the green fog had changed to blue. The second plate was exposed after drying, and developed with ammonia, the shadows being deep ruby. The third plate, exposed like the second, was developed with the Monroe formula (page 477 of the present volume), and resulted in a most splendid negative. From this he (the Chairman) concluded that soda was the best alkali to use with plates having a tendency to red or green fog with ammonia.

The Chairman then announced that the monthly series of lecturettes would be continued through the winter months. "Toning" would be the subject next dealt with by Mr. W. M. Ashman, on Thursday, October 9th.

Bristol and West of England Amateur Photographic Association.

The usual monthly summer excursion of this Society took place on Friday, the 29th of August. Amongst those present were Mr. T. Davey (President), Colonel Playfair (Vice-president), and the Hon. Secretary (Mr. H. A. H. Daniel).

The locality fixed upon comprised the very romantic districts of Moorend and Glen Froom, and that portion of the latter beautiful scenery enclosed in the grounds of Mr. Vassall. On arrival at Fishponds the party found that ample accommodation had been provided for carriage, and a short drive landed them at the new country residence of Mr. Daniel. After a substantial luncheon, a start was made for work. The weather, which for many weeks had been unintermittingly fine, at once began to storm at the little party; but nothing daunted, and with the shelter afforded by focussing cloths and other impromptu devices, the old mill at Moorend was reached.

Here a long and patient halt was made, for "the wind it blew, and the leaves they shivered." At last a few shots were made despite the movement of the foliage, and a move was made for Frenchay and Glen Froom, distant about two miles. Near the entrance to Oldbury Court Park, but on the wrong side of the river, stood a very enchanting-looking cottage, and all agreed that it might make a good picture, so a formal request was made to the lady in charge that we might be permitted to carry away her house—photographically speaking—a descent being made on consent. Disappointment, however, was the result, as on trying to secure a point of vantage for fixing the cameras, it was found an impossibility to get a view without standing up to one's waistcoat in the middle of the river.

Thence to the private grounds of Mr. Vassall, than which nothing can be prettier in their way. Here, in fine weather, and with better light than favoured the party, there is ample store for a good day's work; but time was passing, and light was waning, so the word was given to march onwards. Then ensued the usual and very acceptable wind up of these and similar delightful excursions—the tea and coffee, &c. Never was a pleasanter gathering, even if the result in pictures was perhaps not quite so good as upon some previous occasions.

Liverpool Amateur Photographic Association.

The ordinary meeting of the above Association was held on Thursday, the 25th ult., at the Free Library, Mr. J. H. Day, Vice-president, in the chair.

The minutes of the June, July, and August meetings having been read and confirmed, Mr. J. Eaglesfield was elected a member of the Association.

Mr. W. H. Kirkby introduced a resolution on the subject of the July and August out-door meetings, and said that he thought it would better conduce to the welfare of the Association if these meetings were held, as usual, in the city. After some discussion, Mr. Kirkby said he would propose a new rule at the next meetiug, and the subject dropped.

The Chairman announced donations to the print collection of of the Society, by Messrs. Watts, Williams, Hartley, and Whaimby.

Mr. H. N. Atkins gave some account of his success in the production of paper enlargements, and passed round some very fine specimens of his work.

Mr. J. H. Day said he had obtained good results with Morgan's paper, and showed a print from a waxed negative, which was perfectly sharp, and could not be distinguished from an ordinary glass negative.

A Member exhibited an excellent enlargement, 16 by 12, made in this way on gelatino-bromide paper from a quarter-plate.

The Rev. H. J. Palmer read an important resolution passed at the last meeting of the Executive Committee at the Associated Soirée:—That a certificate of merit be awarded by the Soirée Executive Committee to the best series of six photographs, taken by an amateur, of subjects within a radius of ten miles from Liverpool," and urged the members of the Association to join in this useful competition. Mr. Palmer further reminded those present of the number of interesting negatives of subjects connected with the Liverpool of the past, which had been taken by members of the Society. He hoped that these would all be printed afresh, that members would produce numerous other pictures of scenes which were now fast disappearing, and thus that a really useful and valuable collection of views connected with Liverpool might be available for exhibition at the coming soirée.

Mr. J. A. Forrest remarked that one wall of the old slave market of Liverpool was still standing.

The Chairman spoke in cordial approval of the competition and of its objects, and thought that the Association should assist the project by giving a prize.

It was resolved that the Association assign two of its presentation prints, properly mounted and framed, as a first prize for the best series of six prints of Liverpool, &c., and one such print, also mounted and framed, as a second prize.

Mr. H. A. Wharmby gave notice that he should, at the next meeting, move the following addition to the rules:—Each member shall send in to the Secretary, at or before the meeting following his election, his carte portrait for insertion in the Society's album.

Mr. Green gave an interesting account of his mode of collodionizing and developing 24 by 18 plates, and remarked that negatives taken by him with his large camera at Melrose, Furness, Conway, and other places, and varnished twenty-five years ago, were now just as bright and good as ever.

Mr. Forrest exhibited three views taken at Rivington, two at Tal-y-Cefu, and one at Bidston at the last excursion; Mr. Baker, a clever instantaneous picture of "A cat in the act of springing on a bird;" Mr. Day, some very fine negatives of Carnarvon and Amlwch Coast, with prints; Mr. Wharmby, views at Sefton, Walton, and Bidston; and Messrs. Hartley, Watts, and Haworth some prints from their negatives taken at Condover, Pitchford, and Wenlock.

The meeting was then adjourned.

Talk in the Studio.

Nickel Vessels.—Prof. Dittmar has recently advocated the use of nickel vessels for use in treating solutions of caustic alkalies. In its resistance to the action of soda and potash, nickel is equal to any metal, whilst for its cheapness it surpasses silver. Mr. J. Spiller (Photographic News, vol. 15, p. 462) recommended the plating of metallic surfaces with nickel, for photographic purposes. Nickel plated copper and brass bars, immersed in a silver nitrate solution, do not reduce the metallic salt. Nickel-plated copper gauze would prove valuable for breaking up emulsion jelly; and nickelled wire corners to wet plate carriers would be much cheaper than those of silver.

A Photographic Section has been formed within the Literary Club, Blackburn, Lancashire, open to all members of the Club, many of whom revel in the dark deeds of photography. During the winter, four meetings will be held at the Club for the discussion of subjects connected with the art, at 8.30 p.m., as follows:—October 20, "Lantern Slides"; November 24, "Plate Making"; (1885) January 19, "Development"; February 23, "Intensification and Reduction, &c., of Negatives." Two entertainments will also be given in the Lecture Room to members and friends, one on the 19th December, "An Exhibition of Lantern Slides," and the other on the 17th of April next, "An Exhibition of Prints." During the summer it is proposed to have a series of monthly excursions with cameras, due notice of which will be given. The Hon. Sec. would be glad to arrange, if possible, to meet other societies in the district on some of these excursions. All communications should be addressed, The Hon. Sec., Photo. Section Literary Club, Blackburn.

Photography at the Midland Railway Works, Derby.—Mr. F. J. Austin, who writes to the *Leisure Hour*, thus describes a visit to the Photographic Department, which is under the direction of Mr. T. Scottou:—One would hardly expect to find a photographic studio amid such powerful machinery as we have been describing. And yet, not far from the gas-engine house—for the Midland Company make their own gas—there is a small building occupied by an intelligent and skilful photographer, whose duty—and evidently whose delight—it is to take the portraits of the various engines when completed, old bridges before their demolition, new bridges constructed in their place, and any other work of which the Company may require memorials. One picture shows us a train which was photographed while running at a speed of thirty miles an hour; but so instantaneous was the process that there is no mistiness about it. Every line is brought out distinctly. The apparatus used for this purpose might almost be carried in a capacious pocket, the dry plates fixed ready for use in the sliding frame being carried in another, while the stand might be used as a not unwieldy walking-stick. A five-pound note, or even less, would probably cover the whole cost. Among other work accomplished here which saves an immense amount of time and labour, is the copying of tracings and drawings in a few minutes by a process known as "Pellet's process." No camera is required; the tracing is simply laid flat upon the glass under-surface of a large frame (very similar to an ordinary photographer's frame for printing from negatives), and over this is placed a sheet of prepared paper having a bluish tint. After exposure to the light for a few minutes, the paper, which has now assumed a whitish hue, is removed, and the edges having been turned up so as to form a tray three-quarters of an inch in depth, it is floated face downwards for about half-a-minute in a solution of yellow prussiate of potash, until faint blue spots appear in the background. It is then washed in a trough of clean water to check the action of the prussiate solution. This having been repeated two or three times, the print is immersed for from five to fifteen minutes in a bath of hydrochloric acid, the surface being worked all over with a brush to start and loosen the blue mucilage which originally covered it. It is then placed once more in a tray of clean water, and brushed over to remove any mucilage that may still be adhering to it, after which the lines of the print will be seen standing out blue upon a white ground. The whole operation occupies only a few minutes, for the paper is extremely sensitive, the time of exposure (which can be determined by means of test slips) varying from half-a-minute upwards, according to the intensity of the light. The writer saw a complicated tracing of the various parts of an engine, two or three feet in length, copied by this process with such clearness that the faintest lines and minutest marks were in every respect as plainly discernible as in the original drawing.

Influence of Light on the Disengagement of Oxygen by Plants.—J. Reinke has made further experiments, and describes the means adopted by him to measure the oxygen disengaged by leaves in presence of light of varying intensity, by counting the bubbles of gas which escape from a given leaf surface of an aquatic plant in measured intervals of time. *Elodea*, having very thin leaves, is especially suitable. The light of the sun is reflected from a heliostat through a convex lens into a darkened chamber. The intensity of light to which the leaf is subjected then varies according to its position in the double cone of rays formed by the lens. Working in this way the author finds that disengagement of oxygen attains its maximum with light of normal intensity (*i.e.*, at twice the focal distance of the lens, where the diameter of the cone of rays is the same as that of the lens), that it diminishes rapidly, with intensities of $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$; but on the other hand remains almost constant when the intensity is 2, 4, and 8 times the normal. The author has adopted his method of counting the number of bubbles of gas escaping from a given leaf surface of an aquatic plant (*Elodea*) in a given time to the study of the influence of light of different colours on the disengagement of oxygen by plants. The same apparatus was employed as that previously described with the interposition of a prism of known dispersive power adjusted for the minimum angle of deviation, in the path of the conical beam. The spectrum was received on a screen, composed of two vertical plates of wood, adjustable at any distance from each other. The band of coloured light passing between the wooden uprights was concentrated on the leaf by a lens, the distance between the uprights being so adjusted for each colour as to obtain an equal luminous concentration (*i.e.*, an equal number of wave-lengths) in all cases. The maximum disengagement of oxygen corresponds with the maximum absorption of chlorophyll, and is situated in the red, not far from the line B; the curve descends rapidly towards the ultra-red, more slowly towards the ultra-violet; but, contrary to the experiments of Engelmann, there is no augmentation in the disengagement of oxygen corresponding with the absorption-band, commencing between the lines *b* and F, and extending over the whole of the right side of the spectrum.—*Journal of the Chemical Society.*

The Photographer to the Greely Expedition.—The diary of Sergt. Rice (the photographer of the Greely Expedition, who died before the rescue) abounds in evidence of the attempt of the members of the Greely party to enliven each other's spirits during the long periods of desolation at Fort Conger. To judge from his notes and suggestions, Sergt. Rice was himself no small contributor to the general amusement. They had a paper which they printed on the polygraph, called *The Arctic Moon*, and some articles intended for it are found in the diary; the following being one of these:—"*A word to photographers.*—Suppose the photographing of a baby, who has been given to a couple whose motto for years has been 'hope.' Describe said babe a beautiful, innocent, dew-eyed darling—the preparation of the baby for the photographer's manipulation. The babe is gorged by the mother as the Bedouin would a camel before starting on a desert journey, so that it would be quiet and content. Results in babe's indigestion. Then the attending troop of relatives. The photographer must await the arrival of someone who is said to charm the babe. Baby gets tired, but must be photograped smiling. He must vouchsafe a smile of benevolence, while in

heart he desires to out-Herod Herod. The next subject is the beauty—or the faded beauty—who is, as are also her friends, dissatisfied with the photograph of her in the sere and yellow. Or the young old lady who resembles Mary Anderson or Adelaide Neilson. Or the ignorant lady who will not tolerate a shadow under her chin. Or the General with the battle scar, which his patriotic wife worships. Suggestions from carte-de-visite. The social equality of the arrangement of photographs in a shop-window—Henry Ward Beecher cheek by jowl with Pat Rooney. It is easy to recognise a photographer (unless he makes all his pictures by chance) by the manner in which the subject is posed, and the arrangement of the light. A photographer has negatives in number equal to the population of a country town. Quote the criticism on Walter North's garden scene. The sense of beauty and best momentary pose of the body is a gift that cannot be picked up as a mechanical art can be—instance among difficult subjects the fat woman—'like heavenly pastures, large and fair.' The trial of the jail photographers, the 'Bashful Sitter.' Custom-house officers who want to see the dry-plate.—*Photographer's Bureau.*

The Precious Metals in Mexico.—The greater portion of the gold and silver mines that are now in action were worked at the time of the Spanish conquest. While the country was under Spanish rule, that is to say from 1537 to 1821, the mines produced gold to the amount of £13,753,682, and silver to the amount of £117,253,940. Since that period, and up to 1880, the mines produced gold to the amount of £180,131,662. The total value of the gold and silver produced between 1537 and 1880 is £621,022,042, the average annual production being to the value of £1,812,000. Compared with this, California, Nevada, Colorado, Utah, Dakota, Montana, Idaho, Oregon, Washington, New Mexico, and Arizona, have produced the precious metals from 1848 to 1882, of a total average value of £13,560,000; and a large portion of this was obtained from territory which formerly belonged to Mexico. It has been found necessary to abandon mines, even when yielding more than nine troy pounds of silver to the ton of ore, on account of the difficulty of transport and want of labour; but with systematic mining and economical methods of reducing the metal, added to the necessary capital and improved means of communication, Mexico would regain the foremost position among countries producing the precious metals which she held up to 1848. The completion of the central railway, which traverses the state of Chihuahua, will contribute towards bringing about this result. It has often been said that there is no coal in Mexico, and that this want will prove an obstacle to the development of the natural resources. This, however, is not the case, as the Government has published an official list of localities where coal deposits exist. Petroleum is also found in large quantities.—*Journal of the Society of Arts.*

Photographic Club.—At the next meeting the subject for discussion will be on "Artificial Lighting."

To Correspondents.

*** We cannot undertake to return rejected communications.

Ebbw Vale.—It is quite possible that the paper you used may have been rather strongly sized, and the size would naturally prevent the thorough and uniform penetration of the fatty matter. Try the effect of soaking the prints in hot water and drying them, before treating them.

H.—Messrs. Burgoyne and Co., wholesale Druggists, of Coleman Street, City, keep it in stock.

John Smith.—Your experience is of considerable interest as confirming the experience of many others, as to the advantages resulting from the use of the potash developer.

T. S. (Derby).—Thank you.

G. A. Oldham.—We are strongly inclined to think that they arise from some deleterious ingredient in the mount. Cut a print into several pieces, and mount these on the various samples of card you may have in stock, and keep all under the same conditions. The results will probably speak for themselves.

W. G. H.—We hardly think they could be made for a few pence, unless many thousands of precisely the same pattern were required. Still you may be able to introduce them successfully into the market. Provisional protection for a year can now be had at a cost of a trifle over £1, if you will fill up the form yourself, and do not require the assistance of a patent agent. The form can be obtained through any post office. In your specification you must clearly state the novel points of your invention.

R. Percy.—1. Not many days, and in hot weather, perhaps not one day. 2. Very shortly.

Carmina.—The best thing you can do is to use the so-called encaustic paste, made by melting one ounce of white wax cut into shreds in five ounces of oil of turpentine, a gentle heat being required to effect a solution. Apply a trace of this to the surface of the print with a piece of flannel.

J. S.—Print the title from ordinary type on thin paper which has been previously coated with starch paste and dried, and then, after very slightly damping, transfer by pressure to the varnished side of the negative. The paper is now thoroughly wetted and stripped off, leaving the printing-ink behind. Dust the impression with powdered red lead to make it opaque. Full details will be found on page 517 of our volume for 1883.

Pogator.—They are quite sufficient, and of the three we should prefer Captain Abney's book. 2. Quite so, but nothing more modern in any way surpasses it. 3. Through a foreign bookseller, as, for example, Trübner, of Lugate Hill.

R. D. Barret.—You will not find it easy to deal with the actual manufacturers of the brass rims unless you require a large quantity. We believe that most of them are made in France. You had therefore better obtain through the ordinary trade channels.

F. Francis.—If you buy your carbonate at the price you mention, it will cost you more to restore the old developer than the whole thing is worth. Ask for "pearl-ash" at the oilshop; it should cost sixpence per pound.

H. C.—Unequal hardness of the paper is the cause; otherwise the quality appears to be good.

Mechanic.—That which you require can be had from Messrs. Sprague and Co., Lithographers, Martin's Lane, Cannon Street, London.

Thio.—1. A portrait combination having an equivalent focus of twelve inches will do well for both. Possibly you may have to put a block or distance piece on the front of the camera for a lens of this focal length. It will cost something over twenty pounds if you go to a first-class maker. 2. You probably had sixpenny bottles of Judson's aniline dyes, and there will be no difficulty in obtaining these. At any rate, the aniline dyes will answer your purpose very well indeed.

Lux.—1. You must place a shade over your sitter, so as to do away with the whitish glare on the front hair. 2. It is difficult to understand your difficulty, as it dissolves in twice its weight of water. Just run over the matter again, and see if you have not made some mistake.

C. W. W.—Mr. Cowan tells us that is not so.

C. Weston.—Float letter paper on a solution made by dissolving 1 drachm of red prussiate of potash and 1 drachm of ammonia citrate of iron in 1 ounce of water. When dry, expose under the tracing, and fix by mere washing in water.

The Photographic News Registry.

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Retoucher, in a fortnight.—E. P. W. Taylor, 9, Ivory-ter., S. Lowestoft.
Oper. & Retouch. (first-class).—X. L., c/o Miss Allandale, 233 Maida-vale

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1362.—*October* 10, 1881.

CONTENTS.

THE PALL MALL EXHIBITION.

PICTURES AND APPARATUS.

THE opening soirée of the Exhibition may now be looked upon as a meeting-place for those interested in photography, and on this occasion the principal London and country photographers have an opportunity of exchanging a few hasty greetings with each other; in fact, one may say that, on the opening night, most of those present are rather looking after their friends or acquaintance than critically examining the pictures. To say that the room was crowded scarcely expresses the whole truth, as about nine o'clock so compact was the mass of visitors that the direct journeying from one end of the room to the other became a labour only to be attempted occasionally. About half-past nine locomotion became easier, and soon after this the Lord Mayor-elect, with his lady, visited the Gallery.

As regards the pictures, the general expression was one of satisfaction, although here and again one came across someone who felt sure that the show would not bear comparison with that of last year. All, however, seemed agreed that there was a remarkable absence of decidedly bad photographs; while there seemed to be a general notion that the very exceptionally good was also notable by its absence. The above views of the case are by no means in contradiction with the opinion we have formed, namely, that the Exhibition, as a whole, is above the average.

Complaints regarding the hanging committee or the judges were few, and by no means bitter: but now and again some exhibitor who had been skied condoled with one who had been abased to the lowest level; but even then it was generally allowed that in the case of all the other pictures the Committee had exercised good judgment. The disappointed exhibitor who knew that he ought to have received a medal, generally refused to be comforted by anything less than a patient listening to his views as to the partiality and blindness of the adjudicators.

It is said that a goodly portion of pictures were rejected this year, and perhaps to this circumstance we may attribute the paucity—indeed, may we say, absence—of bad photographs this year. "I would have been content and proud had they admitted but one of my frames," remarked a meek-faced little man who had vainly looked round the walls three times in the hope of finding his pictures, when a medallist comforted him by pointing out that even one out of his three frames had been rejected.

The work of Mr. Tagliaferro has been most fully honoured by the judges, for not only have they awarded him a medal for his series of four pictures, representing the interior of the Cathedral at Malta (No. 234), but they have also given a similar award to the Autotype Company for a pair of excellent enlargements, one of these enlargements (No. 217) being from Mr. Tagliaferro's prize negative, and the other (No. 135) from a negative by Mr. Sinclair.

The medal picture of Mr. Tagliaferro certainly is far more effective and striking when looked at in the shape of an enlargement than when the original (10 by 8) is viewed. The Cathedral Church of St John, at Malta, is one of exceptional beauty and grandeur, but is a little out of the usual run of the British tourist. Erected by the knights of Malta when they were in the height of their power, a trifle over three hundred years ago, the decoration and elaboration of the church was their constant care until their overthrow two hundred years later; and its magnificent frescoes, mosaics, and carved work are, like those at St. Mark's, in Venice, the result of a requisition made over the whole of the civilised world. The view of the high altar which is the subject of the enlargement is taken with the camera sufficiently out of the axial line of the church to destroy the painfully symmetrical effect which is an almost certain consequence of taking such a subject directly in face. It will be noticed that the vertical lines of the subject are a trifle out of the perpendicular in the photograph, and it is surprising to notice how many photographers are faulty in this respect—the result of haste and carelessness in adjusting the camera. Three other general views of the interior of the cathedral accompany the medal picture; one of these showing the high altar from a more distant point of view, so as to include some of the massive piers which form a main support of the structure, while the remaining photographs show two out of the twelve aisle chapels. In Mr. Tagliaferro's splendid pictures one can find none of those heavy detailless blanks and extended chalky lights which mar so many interiors; but so evenly detailed and perfectly gradated are the photographs, that one needs but the effect of colour to thoroughly realise the beauty of the frescoes on the ceiling, the arabesques, leaves, flowers, &c., which are sculptured on the walls from floor to ceiling, together with the precious stones and gilded metal work which decorate the marble of which the high altar is built Another frame exhibited by Mr. Tagliaferro shows four of the monuments erected to the memory of the most distinguished knights, that erected in honour of the Grand Master, Emanuel Pinto, being the most striking; while in a third frame we find that Mr. Tagliaferro has used his camera successfully to depict indoor life in Malta.

Mr. H. P. Robinson receives a medal for his "Mill Door" (No. 67), in which a bag of meal is being loaded on donkey-back, and among those who are ardently interested in watching this and other operations incident to the business of the mill one finds the main interest of the picture. The subject is a simple one, but it is invested with that charm and feeling which Mr. Robinson so well knows how

to infuse into his productions. Still, it rather surprises us that the judges did not prefer to award the medal to "He never told his love," a composition into which the artist-photographer has thrown much more of his especial individuality, and in which his strongest point—the telling of the story by the facial expression of the models—is most strikingly exemplified. He who can properly take advantage of circumstances is the man of true genius; at any rate, this is about the way in which Goethe states the case, and by turning back the NEWS to p. 468 of the present volume, one may find an account of the origin of what we are inclined to regard as the gem of the Exhibition—Robinson's "He never told his love." Let us quote Mr. Robinson's own account of the matter. He says:—

"One day I could not have the keeper who usually attended me, and I had to take an under-gardener. This man was a pictorial treasure. He was old, and had scarcely been further from the estate than Mold in his life. He was essentially a happy-looking old man, and full of native wit. I had been looking for a view some way off, and returning, saw my old man sitting on a rail in the hedge, surrounded by the models, who were chaffing him in Welsh and English. They made a picturesque group, and I heard one of them say, 'He never told his love.' Here was subject and title together, and was at once secured."

As in this case, good subjects for the camera may often be found ready-made and to hand by the observant and ready-witted photographer; but only one in a thousand can take advantage of what is offered to him.

Other pictures by Mr. Robinson are to be found in the gallery; (No. 53) "He loves me, he loves me not," recalling a means of divination so common among the sentimental maidens of the Fatherland; while "Come Across" just illustrates the well known fact that it is often very much easier to exhort another to do a thing, than to do it oneself. (No. 64) "The Cuckoo" shows us four children who are looking towards the place whence the always-welcome note seems to come; but holding up "The Gilly Flower" for baby to look at appealed more strongly to the maternal instincts of the fair visitors, if we may judge by the expressions which we noticed in front of the frame, and the remarks made. "A Chat with the Miller" (68) possesses some of the characteristics of "He never told his love," but the "Music of the Birds" is more akin in its nature to "The Cuckoo." "Finding the Calves" is a field scene, and would perhaps be better if the main figures were a trifle larger; and the mystic title, "Yn Cymraeg a Saesneg," will be unintelligible to those who have not made a study of the language of the Principality. "The Stream in Summer" gives a fine representation of

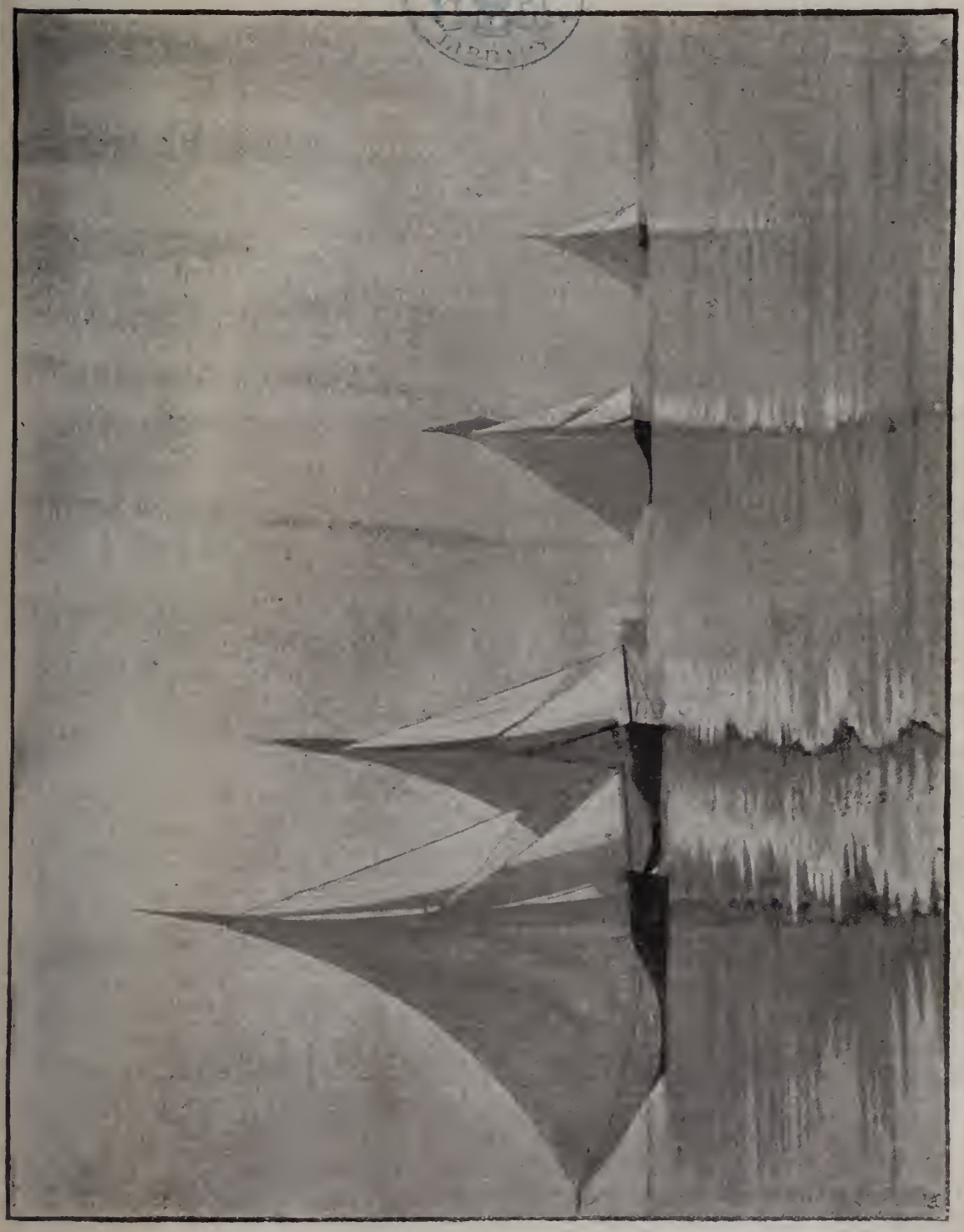
HANGING THE EXHIBITION PICTURES.
Negative by A. L. Henderson. Phototype Block by the Meissenbach Company.

that close rich foliage that crowds around our water-courses.

Mr. W. P. Marsh well deserves the medal which he has gained for his "Instantaneous Sea Studies" (No. 43), the anger and fury of the stormy sea being strikingly shown by bold clouds of foam in these pictures; indeed, in one picture the foam-cloud may be seen to rise to the full height of a large house, and an enlargement of this subject is shown on the opposite side of the gallery (No. 269).

The Swiss views of Vittorio Sella are well known to continental tourists, and it is pleasing to note that the judges have so far appreciated them as to give them an award. Four are shown: "The Lys-kamm," "Mont Blanc," "Märjelen See," and "Monte Rosa."

No. 135, which, along with 217, takes the medal for enlargements, is from a negative by Mr. J. C. Sinclair; it is called, "A Peep at Derwent Water," and affords a fine example of ærial perspective, not too much exaggerated, hill and cloud nearly blending in the extreme distance.



MARJORIE. MARGUERITE. GENESTRA. TARA.

Yachts on the Solent. Photographed by G. West and Son, Gosport. Phototype Block by the Meissenbach Company.

In our notice of the Brussels Exhibition of 1883, we referred to the magnificent examples of instantaneous photography contributed by M. Grassin, of Boulogne-sur-Mer; and it is gratifying to notice that he has come to the London show, and has conquered; the actual picture for which he is awarded a medal is his "Breaking Wave" (No. 153), a remarkable production. There seems to be a large black hollow like the entrance to a cave in the gigantic mass of spray and foam which advances. His remaining pictures, the "Folkstone Boat entering the Boulogne Harbour," his celebrated "Express Train," which we have already referred to, his "Fishing Boat" (No. 367), and "Yacht and Fishing Boat" (No. 368), are all very striking productions; but to us, the most effective as a picture is (No. 207) the "Quai Gambetta" at Boulogne," showing the active life of the pleasant French watering place.

A chill seems to pass through one on glancing at Nos. 167 and 168, two winter scenes in Mr. G. Renwick's well-known style. The cold is in the air of the pictures rather than in the solid objects, and to see the square tower of the old church faintly outlined through the frost-loaded air is to feel the intense realism of the representation. Mr. Renwick well deserves his medal. Here, it may be observed, photography is at its best; there being no colour in the original subject, the absence of it is not noticed in the photograph.

Mr. Berkeley's productions, printed in platinotype, have all the charm of good photographs, together with the peculiar beauty which accompanies a good steel plate engraving. (No. 209) "The Thames at Pangbourne," (219) "A likely place for a trout," and (220) "Aground, Pangbourne Loch," for which a medal has been given, are charming, the delicate gradations of sheen on the water, and the breaking up of the light by the trees, being rendered admirably.

In portraiture, Mr. Mendelssohn is prominent, and there is an individuality about his pictures which runs through all: notwithstanding that the lighting is bold and well-marked, those deep, heavy, and extended shades which so often mar portraits lighted on the so-called "Rembrandt" system are absent. Mr. Mendelssohn evidently believes in so exposing and developing as to secure full detail everywhere. The poses have much originality and grace; the picture of the medal series (Nos. 243, 244, 245, 246, 247, 248) which seems to us to be most happy in this respect, is the portrait of Miss Grant, in which the model is inclined slightly forward, with the eyes directed a trifle downwards. A little consciousness of the neighbourhood of the camera is obvious in No. 248, "The Misses Sandbach," those ladies being represented—one standing and the other sitting—at a work-table.

Mr. Hubbard deserves much praise for his admirable composition, "A Mother's Love." The poorly furnished cottage room contains little which the mother can value but her babe; and as she leans loving and anxiously over its cradle, one can realise the position at once.

To say much regarding the fresh and vigorous pictures of yachts, for which Messrs. West and Son have received so well-deserved a medal, is unnecessary, the class of work which they turn out in this direction being so well known. Perhaps the best of the series is that which forms our illustration on page 643. It is printed from a photo-type block made by the Meissenbach Company. Beginning at the left hand of the picture, the order of the yachts is as follows:—Marjorie, Marguerite, Genestra, and Tara.

In "Out of Sorts" (No. 330) we have a picture of the kind which has made a name for Mr. Adam Diston. The patient is an old Dutch clock, and the ancient dame who is endeavouring to infuse new vigour into it by blasts from the kitchen bellows is evidently as deeply interested in the welfare of her charge as ever Court physician was regarding the future of his Royal clients. Mr. Diston, who may be considered to be essentially the Gerard Dow among photographers of the present time, can infuse a depth of meaning and detail into the blackest holes and corners of an interior. Mr. Diston only exhibits one picture, but that one picture is a host in itself.

No. 362, a frame of small studies, by Mr. G. Hadley, must be looked well into, but will reward one for the pains. Photo-miniatures may often be overlooked among so many large pictures. Mr. Hadley has earned his medal.

Lafayette, of Dublin, exhibits excellent portraits, and for these he has been awarded a medal. The most striking is perhaps a picture of two ladies at the piano, one fingering the keys, and the other standing at her right-hand side, we will suppose, singing.

The photo-engraving process of Messrs. T. and R. Annan so completely and thoroughly renders all gradations of a negative, and, moreover, in a grain so fine as to appear like a uniform tint, that it would have been difficult for the judges to have passed over their exhibits without making an award. The charming picture of Norfolk Roads (No. 464), together with the portraits of the Duke of Buccleuch, and of Sir Daniel McNee (No. 474), are those for which the medal is given; but it is difficult to look on them as better than the rest. For high class book-illustration, the photo-engraving method of Messrs. Annan should have a good future before it.

Photography as a means of assisting in microscopic work is becoming of increasing importance each year, and it is gratifying to find that the importance of this development of photography, and the excellence of the work exhibited by Mr. Atkinson, have been recognised by an award for the frame of enlarged microscopic objects contributed by this gentleman.

The photograph of lightning shown by M. Auty differs much in character from that of Herr Haensel, which we reproduced on page 2 of our present volume, as in M. Auty's picture the discharge appears to have no definite starting and terminating points. A medal has been adjudged to M. Auty on account of the scientific value of his production.

The last medal picture to be noticed is Mr. S. G. Payne's exhibit (No. 528), "Knuckle down tight." A capital subject for the camera is a game of marbles, but how few can do it justice! The two lads who are standing in the background watching the game do so with an expression of interest and concern which is most admirably realised.

Our notice of the medalists pictures is now complete, and next week we shall commence our systematic walk round the room, and description of the pictures.

On the tables there is an extensive collection of apparatus, but very little which is novel. Indeed, there are very few contrivances which are the outcome of the past year's work, or which have not been shown in the gallery before. So crowded are the tables with what may be considered the ordinary production of the manufacturers, that the few novelties are practically lost to the bulk of the visitors. In fact, the show of apparatus has degenerated to but little else than a trade exhibition of every-day goods—excellent and well-made specimens, it is true—but still out of place in an exhibition which should represent progress during the past year. Another circumstance which cannot fail to strike the visitor as unsatisfactory is the fact that a number of trade catalogues and general price lists of photographic requisites are allowed to remain on the table for distribution. That some houses should thus be allowed to push their business is very unfair to those whose feelings of what is becoming will not allow them to so lower themselves. It might be an excellent plan for the price to be marked on every piece of apparatus which is made commercially, as the price is sometimes an essential in forming an opinion as to the merits of an invention; but that the exhibition of the Society has been made a means of distributing circulars and general lists of photographic requisites is a matter to be regretted.

Mr. Herbert S. Starnes shows a well-designed camera of the "detective" type; camera, changing-box, and plate-box, being united in one. The changing of the plate is effected by a sleeve at the back of the apparatus.

The "Camera Adapter," designed by Mr. Shew, is likely to be useful to those who may wish to avoid the expense and inconvenience of numerous cameras. The idea is to adapt a movable extension piece to the back of a small camera, so as to virtually make a larger instrument of it. The adapter has on the one end runners to fit the small camera, and on the other end grooves to take the large slides, and the idea is well worked out by Mr. Shew. Possibly the time may not be far distant when all commercial slides will be made to recognised standards, and should this be done, such adapters as we have referred to will be extremely useful.

A new model of the Cadett pneumatic shutter is exhibited by Marion and Co. It is simply a lift and return shutter neatly made of ebonite, and is likely to be useful in the studio, as it works without noise, and may be placed inside the camera.

A large number of excellently made stands are shown, it being a significant fact that all but one have adjustable or sliding legs.

Plate-boxes made of sheet metal are exhibited by Mr. T. Samuels, but there are no grooves, each plate being held by a kind of frame of tin, consisting of a sheet of the metal with the edges turned over, so as to grip the glass.

Nos. 628 and 629 are compact and well-designed cameras of the "detective" type, designed by Professor Ezutchewsky, and instead of using a focussing cloth, the required shade is obtained by a bellows-like hood, which can be extended at pleasure. In one of the apparatus, the changing of the plates is effected by reversing the arrangement. We shall say more regarding the apparatus next week.

On Monday evening an exhibition of lantern slides was held, Mr. York contributing some views of London; Mr. Moncrief and Mr. Brooks, charming views of Wales; while Mr. George Smith, of the Sciopticon Company, showed that when a Woodburytype slide is coloured with pure carbon, the tone is an agreeable warm brown. Mr. Pringle and Mr. Fineham also exhibited excellent lantern transparencies.

Practical Papers for Beginners.

No. 11.—MAKING LANTERN SLIDES.

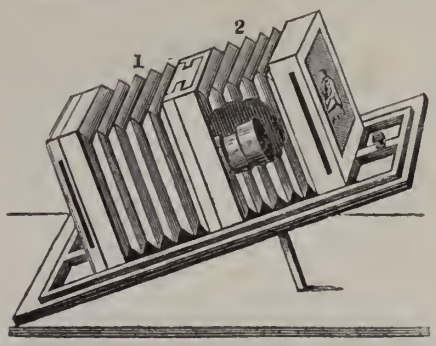
The non-professional, or amateur, will often find it much better to lay himself out for making transparencies to be exhibited by means of the magic lantern, than for the production of silver prints. For exhibition to circles of private friends, the lime-light is by no means required; a well made lantern of the Sciopticon type (p. 629) giving abundant illumination, although ordinary paraffine oil is burned.

The non-professional who makes silver prints is very much at the mercy of his friends, who think they are complimenting him by asking for copies of his pictures, and the result is that he is often without copies himself, or may be he has only a few waste impressions which he did not consider good enough to give away. When, however, the beginner boldly announces that he does not make pictures on paper, but that his productions are to be seen at such and such a time upon the screen, he avoids the inconvenience of having to be constantly at work making copies, as comparatively few persons would ask for a lantern slide. Apart from this, there is no question whatever that the very best way of fully displaying the merits of a good photograph is to project it upon the screen. Supposing that the negative is set up against the light—as, for example, in a window—and photographed on such a plate as would give a negative of an ordinary object, a transparent photograph is obtained, but the quality and tone of the resulting transparency depends very much on the process employed, and the details of manipulation.

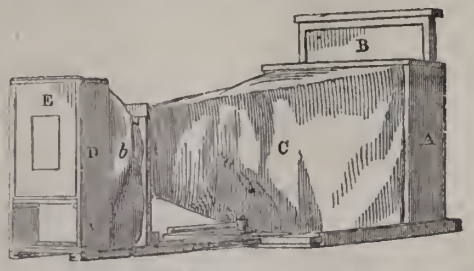
Before entering into the vexed question as to which process should be adopted for making the lantern transparencies, it may be well to say a few words about the manipulations incidental to exposure. When the reproduction is to be made from a quarter-plate negative ($3\frac{1}{4}$ by $4\frac{1}{4}$) the camera may be dispensed with, it being sufficient to place the original negative, film side upwards, in an ordinary printing frame, and to lay the sensitive plate upon it, both films being in contact. The exposure is now made, a few seconds at a distance of a foot or so from an ordinary gas flame being sufficient in many cases. It should be noted that the standard height for the photographic lantern transparencies is $3\frac{1}{4}$ inches, or the narrow dimension of a quarter plate; and although many makers of slides make the width to correspond with the height, there are a few who send them out $4\frac{1}{4}$ wide. It will thus be seen that unless the dimensions of the picture are to be altered, it is not necessary to use a camera in the production of the transparent positive. Still, in very many cases, one has to enlarge or reduce from the original negative in order to obtain just so much of the subject as is required.

Although it is quite practicable to set the negative up in a window, and to copy by adjusting the camera inside the room, it is far more convenient to set up a special copying camera if one intends to make lantern slides as a regular thing.

The subjoined drawing represents the usual type of copying or enlarging camera as used for this purpose, and it may be regarded as two adjustable cameras joined front to front,



and mounted on a hinged framing; so that the upper end, which carries the transparency, may be directed towards the sky, while the dark slide is adapted to the lower end. An arrangement which answers quite as well as a special enlarging camera can generally be extemporised from two cameras, a funnel-shaped connecting piece of black cloth being used to connect, if the cameras themselves are not adjustable; the following sketch will make all clear.



In copying with the camera, it is often advantageous to put a sheet of moderately fine ground glass behind the negative—that is to say, on the side farthest from the lens—indeed, a piece of ground glass so placed often appears to add in a remarkable way to the intensity of the illumination and the brightness of the image on the focussing screen.

If transparencies are made on the ordinary gelatino-bromide plates, and developed with pyrogallic acid and ammonia, as directed on page 531, it is an excellent plan to

brighten up the image by soaking the finished transparency for some hours—it may be as much as eighteen or twenty—in Mr. Cowell's clearing solution:

Alum	1 part
Citric acid	2 parts
Water	10 ,,

If the negative is a little clouded, or requires reduction, it is well to add enough of a strong solution of perchloride of iron to make the solution the colour of sherry.

Many persons, however, prefer to develop transparencies for the lantern with the oxalate developer prepared as described in our last Practical Paper (p. 620); but those whose ambition it is to make slides possessing the richest and most pleasing tones should undoubtedly adopt the gelatino-chloride process of Dr. Eder.

Gelatino-chloride plates are now an article of commerce, but the following directions will enable the beginner who has followed our papers to make his own.

The emulsion is prepared much after the manner generally adopted for the production of a gelatino-bromide emulsion. Twenty-five parts of gelatine are dissolved in 200 parts of distilled water, together with 7 parts of sodium chloride and 6·40 parts of ammonium chloride, it being convenient to allow the gelatine to swell for half-an-hour before applying heat. The gelatine being dissolved, and the solution at 50° C. (122° F.), a silver-nitrate solution containing 15 parts of the salt in 200 parts of water is gradually added with agitation; and it should be noted that it is advisable to warm the silver solution to the same temperature as the gelatinous liquid.

The chloride is deposited, under these circumstances, in a very fine state of division, and the mixture is at once poured out to set, a beaker or drinking-glass serving very well as a mould, and external cooling may be resorted to when it is desirable to work expeditiously. The gelatinized emulsion may now be divided and washed as directed on page 596, after which it is melted, and plates are coated according to the directions on the page referred to.

An exposure of from one to three seconds is required when the transparency is made in a printing frame, and exposure is made by diffused daylight; while thirty minutes at a distance of five feet from an ordinary bat's-wing burner may be considered an average exposure when gas light is made use of.

The developer is prepared as follows:—

A solution of 600 parts of commercial citric acid in 2,000 parts of water is prepared, a gentle heat being employed to dissolve the acid; and the liquid is next neutralized — or, rather, made very slightly alkaline — with ammonia, about 300 parts being required for this purpose. Red litmus-paper should be slowly turned blue by the solution at this stage; but if, by inadvertence, too much ammonia has been added, this excess may be readily removed by heating the liquid until the superfluous ammonia has been driven off. The solution in this condition contains, then, the neutral citrate of ammonium, or this salt with a mere trace of ammonia in excess. The next step is to dissolve 400 parts of citric acid in the solution, and to make up the volume of the liquid to double that of the water first used, about 400 parts of water serving for this purpose. The acid solution of ammonium citrate thus prepared keeps well, and, therefore, a considerable stock of it may be prepared, a trace of mouldiness on the surface being of no importance. The formation of this mould may, however, be prevented by the addition of a few drops of carbolic acid.

The standard solution of ferrous sulphate is next prepared by dissolving one part of the crystallized salt in three parts of water (about one drop of sulphuric acid being added to each four ounces, in order to prevent the deposition of a basic sulphate). It will readily be understood that this solution should be kept in a closely-stoppered bottle, as, when oxidized to a notable extent, it would obviously be unfit for use. The above solutions are mixed, when required, in the following proportions, the small proportion of chloride of sodium being added as a restrainer:—

Ammonium citrate solution	90 vols.
Ferrous sulphate solution	30 ,,
Chloride of sodium solution (1 and 30)...	6 ,,

The operation of development is conducted just as in the case of a gelatino-bromide plate, and the image should acquire the necessary intensity in five or ten minutes. Several plates may be successively developed with the same solution.

A solution of hyposulphite of soda containing one part of the salt to ten of water may be used for fixing, and after the plates have been washed and dried it is convenient to place a second glass on the film side, and to bind the two together with strips of paper gummed over the edges. The slide generally looks neater than it would otherwise do if a mask of black paper, having a suitable opening cut therein, is included between the two glass plates. These masks can be purchased ready to hand, or may be cut out with the point of a sharp penknife, a glass shape being used as a guide.

PHOTOGRAPHIC ADVENTURES IN A SAILING BOAT.

BY A. J. WEST.

Those who have been fortunate in spending their summer holidays cruising about the Solent during the sunny month of August cannot but express the feeling of delight they must have experienced in the pleasures derived from such a lovely cruising ground, and in such exceptionally fine weather. How different from last year, which can be well remembered for its wind and rain! The racing yachts at times had rather hard work to make headway, there not being sufficient wind to fill the sails; one day in particular, it was a race for the Town Cup, Cowes, and I looked forward to making some good studies of the fine yachts which were to compete in that great race. I got on board my boat about 7.30 a.m., and left Gosport with a light breeze and a fair tide, which soon carried us to where the yachts would have to pass. After I had rigged the camera up and everything was all ready for action, the wind unfortunately dropped, and we were becalmed about two miles from Ryde; it was very disappointing, as I had hoped for a stiff breeze and a rough sea, but instead of which the water was like a sheet of glass. The sky was an intense blue, not a cloud to be seen, and the sun pouring down its hot rays made the heat almost unbearable. Everything appeared to have lost life, and so strangely still was the air, that sounds which were issuing from vessels a long distance away could be heard with remarkable distinctness. About two miles on our port bow was a fishing smack, and a man could be heard singing, "Wait till the clouds roll by."

"Rather a queer song for to-day," quoth my man Williams, who is rather a dry one.

Looking for the yachts in the direction of Cowes nothing could be seen, owing to a thick brown mist caused by the intense heat.

"We're going to have a regular roaster, sir," says my captain; and he was perfectly correct.

We lay becalmed for over five hours, during which time I took a few steam yachts which happened to come past us. About 2 p.m. the tide turned, and we could just discern, looming through the mist, six magnificent yachts with their spinnakers all set, making towards us. As they came closer, I noticed four together which, I felt certain, would make a pretty picture, but unfortunately I was more than a mile on the wrong side. I asked Williams if it was possible to get the boat over to the furthermost one, and then rake them.

"If you don't mind having a pull, I think we might do it," he replied; "but we shall have to be quick, as they will soon be down upon us. We at once took to the oars and pulled our hardest. The heat was intense, and the perspiration, as it rolled down our faces, gave us a melting appearance.

"I doubt we shall do it," cries my captain. "Pull, sir, pull hard;" and I did, in a most desperate manner. It was a great relief to find that we had only a little further to go to get in position; the yachts were coming up with the tide very quickly. I suddenly remembered that I only had two plates ready; the plates in the other slides had been exposed for steam yachts, and had not been changed. I rushed into the cabin and managed to fill two more just as Williams called out, "You'll be too late; they are up to us." I flew to the camera, hurriedly placed a slide in, raised the shutter, sighted, fired, and dropped on the seat alongside nearly overcome by the heat from rowing and rushing about. As I sat and watched the yachts drifting along, I noticed what a fine effect was caused by the reflection in the water owing to the wonderful calmness. I was, however, soon roused from the reverie into which I had fallen by Williams asking if I was only going to have one shot. This sent me to the camera again, and before the yachts had all passed, I secured six different views of them, the reflection in each one being remarkable. About 200 yards astern of the yachts came a gentle breeze which soon filled our sails, and we steered in the direction of home

It had been a great wish of mine to secure the bow view of a yacht with a spinnaker set, but to do this I should have to sail across her path, which is extremely dangerous, owing to being obliged to get close to her to make a large picture, and there would hardly be sufficient time to get out of her way after the photograph was taken. However, an opportunity offered itself on the day of the Albert Regatta, and I determined to avail myself of it, much against the will of my captain. When the yachts started they had to keep tacking until they arrived at the Nab light-ship, which they rounded, and with spinnakers all set, they came tearing along in the direction of Noman's Fort, where I was hove-to waiting for them. One of them had a larger spinnaker than any of the rest, and I picked her out as my victim. The sun was shining so as to give a perfect roundness to the sail, which cannot always be obtained.

"Now, Williams," said I, "do you see that large yacht bearing down this way?"

"Yes, sir."

"Well, I intend to have her right on the bow, so mind you steer me in that position."

"But we shall be run over."

"I think not, if you use your usual seamanlike skill and judgment."

Having put him upon his mettle in this manner, he remonstrated no longer, but put the helm hard down and sailed towards her.

"It will be a very close shave, and supposing we cannot get out of her way, what shall we do then?"

"Why, be capsized, that's all," said I, laughing.

But he did not consider it quite a laughing matter, and felt anxious over it. The yacht was by this time getting rather close.

"Now mind you look out, sir, and be prepared to take the oars directly you have fired."

I had my slide and shutter quite ready, and as we got nearer and nearer an exclamation escaped me, "What a grand sight!" She looked enormous; the spinnaker was well ballooned out, and the sun shone on it and made a grand effect.

"Now, sir; now is your time!"

I waited two more seconds; then sighted—fired.

"I have got her, Williams," I exclaimed.

"Yes, and she's got us," replied he; "out with the oars sharp, or we shall be run over."

We just escaped; but only by a few inches; her mainsail boom nearly hit us; but, as I told Williams, a miss was as good as a mile. Taking the length of the booms end to end, it was over 100 feet.

Those on board stared at us, and seemed to wonder where we came from; but when they found what we were up to, they waved their hands and shouted out something about good steering, which made Williams almost blush; perhaps he did, but owing to his face being so tanned, I could not perceive it. We often speak of this as one of our dangerous experiments.

On another occasion I thought I would try and take a yacht in a similar position to the *Chittywee*; but there was not sufficient wind to make the sea rough, neither could I persuade the clouds to come and look pretty; but I obtained the position, or nearly so, as will be seen in the photograph of *Buttercup*. It is almost incredible that so small a yacht should carry such a wonderful amount of canvas. I sailed so close under her stern that I could almost shake hands with those on board. In this case I had to obtain the position, whereas with the *Chittywee* the captain on board put her in that position. I happened to see him this summer, and he explained to me that, seeing I was photographing the yachts, and wanting his little craft taken, he thought he would give me a good opportunity, and sailed very close past the stern of my boat, and then payed off. Of course I was not slow in availing myself of such a pretty picture, although sailing so close made my boat tumble about to such an extent as to make it very difficult to take it.

After we had taken the *Buttercup*, we cruised along towards Browndown, and were amazed to find a volley of musket shots come flying around us; the soldiers were practising at the ranges. Whether they mistook us for the target, or whether it was bad shooting, I can hardly say, but am rather inclined to think the latter. Three volleys were fired, and in each case the shots came flying on all sides. One we could distinctly hear with its peculiar "twing," came about two feet over our heads between the mainsail and mizen, that made us duck down, and we felt far from comfortable. We thought the best plan was to lay down at the bottom of the boat out of harm's way, until we had got out of range.

"This is reversing things," says Williams; "instead of us shooting, we are being shot at."

I did not see the joke, as there was no comparison between my harmless firing and their deadly weapons. Two fishermen were rowing in a boat, returning after a hard day's work, and when they found the shots so close, turned, and pulled most desperately. We thought they might have received some hurt, and hailed them, but found, with the exception of a splinter shot away from the gunwale, they were quite safe. They came alongside, and I was soon tempted to buy some fish, which we cooked for tea.

I have traversed over 600 miles in my cruising about the Solent this year, and the different adventures I have met with in obtaining photographs of yachts have been both exciting and amusing.

Notes.

Hanging committees or judges who expect to give satisfaction to everybody are doomed to disappointment; still, it is gratifying to be able to say that we only heard two very decided expressions of disapproval on Saturday evening. In one instance we approached an esteemed friend: he was standing with his back to the wall, and looked dejected. "How d'ye do?" we asked, extending the right hand. His breast heaved, moisture appeared to be exuding from his

eye, with his thumb he pointed over one shoulder, and with an evident effort he said: "They have skied my picture."

The other discontented one expressed himself vigorously and decidedly while standing immediately before a frame of medal pictures. This is how he instructed the by-standers: "They don't know anything about it; why don't they have judges who know something about it? I shan't send any more pictures here—— Eh! what did you say, my exhibit? Well it does, as you say, deserve a medal; but, as I said before, the judges don't understand photographs."

Towards the latter part of the evening, as the haze cleared off, a good view of the eclipse became possible, and those leaving the Exhibition Soirée had an excellent opportunity of seeing the latter phase. At Paris, the *Champs Elysees* was crowded with moon gazers, and a balloon ascent was made from La Vilette. Ma. Banjafield, of Stepney, sends a photograph which he took.

Some years ago, when one of the present Royal Academicians was made an Associate, the election took place between sending-in day and the opening of the exhibition, and the story goes that the works of the new Associate had been rejected, and had to be fished up from the cellars, to take their place of honour on the line. It is whispered that something of the sort happened to a picture in the present exhibition of the Photographic Society. The jurors, it is said, remembered a very important picture, but could not find it on the walls. It was ultimately discovered among the rejected, brought back, hung, and medalled. There is this difference between the two incidents—the paintings were rejected by the deliberate judgment of the Council of the R.A., and the photograph was sent away with the unfortunates by one of those rare accidents which prove that we are all human, and therefore not infallible. We have high authority for saying there is "good in everything," and those who have had the misfortune to find their pictures rejected, may console themselves by fancying that they were among the "outs" by accident.

Mr. T. C. Robinson's find of an original by Michel Angelo at the Fountaine Sale is followed by an account of the purchase of three original paintings by Turner. They represent views of the interior of Exeter Cathedral, and were bought from a broker for £3. Although it is not definitely determined that they are authentic, it is said that £1,500 has been offered for them, and refused.

It is pointed out in the *Papier-Zeitung*, that packing-paper which has been made from pulp treated by the sulphite (bisulphite) process is very liable to give off sulphurous acid, and this may cause injury to metallic and other articles wrapped in such paper. Although a trace of sulphurous acid may do no harm to dry plates or silver prints, we would certainly prefer to have paper free from it.

The second hearing of the summons against Messrs. A. and G. Taylor for using the Royal Arms without authority (see page 613) has been adjourned from Tuesday last, the 7th instant, to Tuesday next, the 14th. It is stated that the case will not come on before two o'clock in the afternoon.

Much that is suggestive is to be found in Mr. Robinson's picture which forms our "ink photo." supplement this week; the bantering aspect of the damsel, who is amusing herself by talking to the old agriculturist, being as much indicated by the general attitude as by facial expression, and in this harmonious unification of the general pose of the model with the main idea of the picture lies much of Mr. Robinson's strength.

Some months ago a number of persons well known in photographic circles were taken unawares by one of the party when a halt was made on the return from an out-door photographic meeting; and although every one had his back to the camera, there was no difficulty in recognizing each person; indeed, more than this, for in several cases the attitudes indicated pretty clearly the part each was taking in the discussion.

Major Serpa Pinto is an experienced explorer, and he has shown his usual good judgment in deciding to attach an experienced photographer to his Congo Expedition, which is just about leaving Mozambique. The artist chosen is an Englishman, and, as there will be 250 carriers attached to the Expedition, ample chemical stores and the most approved portable apparatus will be taken. One thing, however, the gallant Major and his photographic henchman need not trouble about, and that is a dark-room or cupboard for developing the plates. Dark cupboard, forsooth! why the enterprising photographer will have a whole "Dark Continent" at his disposal.

Mr. Braun will be allowed to obtain as good a photograph as he can of the Blenheim "Raphael" before this £70,000 picture is placed on the screen prepared for it in the National Gallery. It would not be a bad idea, indeed, for Mr. Childers to have reduced copies of the work appended to the Supplementary Estimate which members of the House of Commons will be required to vote next session, to pay for the sensational purchase in question. The beauty of the subject might thus possibly influence the votes of the most rigid economists, as well as inspire the speeches of the defenders of the outlay.

It is lucky for Mr. Freeman's suggested use of snuff in the dark-room, to counteract the effect of ammonia fumes, that gelatine plates are so much more hardy in constitution than their collodion brethren. A violent sneeze over a gelatine plate would probably not affect it much; a collodion plate would most certainly suffer. In any case, snuff-taking involves a certain amount of education. If you are unaccustomed to the titillating powder, and you feel inclined to sneeze, the best plan, supposing you to have a plate in your hand at the time, is to put the plate down and have your sneeze out. To restrain yourself to the

bursting point might result in a convulsion which would send a choice negative flying to the other side of the dark-room. We once knew an eminent microscopist who lost his time and temper for an entire evening through holding his breath. He spent an hour or so in getting some very minute sea shells into focus, and just as he succeeded he shut his mouth firmly and held his breath, so that not the least draught should shift the position of the delicate objects. Unluckily, at the very critical moment, his lungs failed him, and though he controlled his lips, he couldn't prevent a violent blast descending from his nostrils, and away went the shells to the four points of the compass. Perhaps, if Mr. Freeman's plan succeeds, we shall have some ingenious inventor advertising "dark-room nosebags for photographers!"

The promoters of the prohibited baby show at Paris have turned their attention to an exhibition likely to be quite as attractive. They contemplate an International Beauty Show for ladies between twenty and thirty years of age. The committee have established themselves at No. 11, Rue de Lille, and are ready to receive photographs of the competitors as a preliminary measure. They do not say whether the photographs are to be "untouched." This is rather an important omission, so far as freckles and wrinkles are concerned.

Miss Anderson, it seems, is a trouble to her photographers. They complain—at least, some of them do—that there is no variety in her face, since her expression never changes. Hence—so we learn on the authority of a journal of fashion—her latest photographs were taken with the actress draped all in black, so as to get an effect from the contrast of those dark garments with the whiteness of the arms, throat, and neck. It is doubtful whether in these photographs Miss Anderson has not erred in the opposite direction. If it be not treason to say so, her arms are very long, and have not statuesque proportions. These defects the method adopted to get contrast has exaggerated.

Is not the date fixed for the exhibition of the Photographic Society of Ireland likely to affect the number of works contributed by English photographers? The exhibition at Pall Mall will be in full swing on October 31st, the last day for receiving at Dublin, and it is not every photographer who cares to print and frame duplicates of his pictures for exhibition. Only those who have gone through the ordeal know what it is to prepare photographs for show purposes. One hungers after absolute perfection of printing, fastidiousness on the question of the exact tone is carried to a fault, and minute blemishes which, in the ordinary way, would be "spotted out," are considered sufficient to cause rejection of the prints. All this is bad enough in the case of single pictures, but when there are four or five in one frame the difficulties are carried to agony point. For these reasons it is a pity that the Dublin exhibition is not held a month later than the date arranged.

Photography has added a proof of the wonderful vitality of the Emperor of Germany. It was not known that he still drove until his most recent photograph, taken at Babelsberg six weeks ago, showed him in cap and overcoat seated in a cabriolet drawn by two white horses, reins in hand, and on the point of starting. Loyal Germans, probably, will not hear of the suggestion that possibly the monarch was placed in the vehicle for the purpose of being photographed. Yet such things have been.

HINTS ON POSING AND THE MANAGEMENT OF THE SITTER.

BY H. P. ROBINSON.

Chapter I.—The Head.

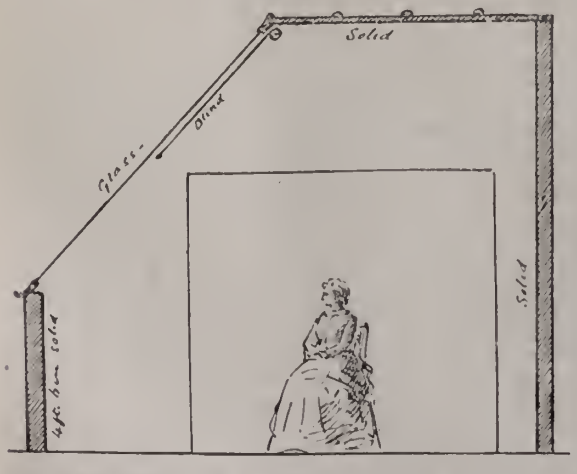
In the following papers I hope to give some general ideas on posing sitters for portraiture, suitable for the requirements of the professional photographer—not, I trust, without being of some use to the amateur. I do not intend to confine myself to the ornamental and elaborate, but shall prefer to give such simple advice as, in my opinion, is calculated to be of most use in ordinary studio practice. Much of it, perhaps, will seem too elementary for the skilled photographer, but I trust that here and there may crop up ideas worthy of the attention of even the most experienced operator. In doing this, I protest against the enervating practice of giving a set of poses for the imitation of those idle and thoughtless operators who do not try to think for themselves and adapt their ideas to their subjects, but who place their sitters, no matter how unsuitable it may be to them, in the same position day after day, as if the posing-chair was a sort of Procrustean bed on which everybody must be cut to the same size and shape and form, and brought to that state of imbecile appearance to which photography is popularly supposed to reduce its victims. A recent writer on composition has some forcible remarks on this point. He says: "Our subjects and our treatment of them must be emphatically our own; but nevertheless, every student of art owes it to himself to get what help he can from the study of the works of the great painters who have gone before. His object should be to notice not only how natural appearances have been modified—or, as it is technically called, treated—by painters of acknowledged fame, but also why this was done. No painter who has in him any spark of originality will directly repeat any effect that has already been painted; but an earnest student can only benefit himself by trying in a measure to look at nature from the point of view of the masters of his art."

For the purpose of these lessons, portraiture may be divided into different classes, such as the head, the three-quarter, the full-length, the seated, the standing, the group, &c. Of all this variety, the head is perhaps the most important, for nine-tenths of the portraits taken in ordinary studios—excluding the lower class and "the beach"—consist of heads taken under different names, such as the Vignette, the Berlin, the Medallion, the Rembrandt. Now it might be thought that nothing could be simpler or easier than to pose a head, and that there was very little to say on the subject; but if we are to judge by the majority of specimens, we see the art of setting a head properly on its shoulders is not given to all men, and the results suggest the notion that their victims were first hanged—*sus. per col.*—and then, instead of being "drawn" according to the old sentence, had been photographed. This broken-necked effect is more visible in Rembrandt's than in the other forms mentioned, although they are not absent from Vignettes and Medallions. The reason why it is more apparent in Rembrandts, probably, is, that this kind of picture is commonly taken in profile, and the strain to turn the head sufficiently makes it lean towards

the camera. Here is an illustration. You have only to add a rope to make the thing complete.

The eye, also, in these shadow portraits, nearly always seems to be afraid of looking straight—the shy, half-frightened, and wholly-deceitful glance of the eye in most of these pictures, suggesting that none but the very worst characters ever had their portraits done in this style. Both these very grave faults are easily avoided. The inclination of the head towards the camera is caused chiefly, as I have said, by the strain in turning to a side view of the face, when the body is in full front view. If the figure were turned to a three-quarter view towards the light, the strain would be lessened, and if the head still leans over too much, a very slight movement of the head by the photographer would set it upright. But I must take the opportunity that here presents itself of saying that the less the operator handles his sitter the better. It worries him, and oftener tends, except in very skilled hands, to stiffen the figure rather than add to its grace. But I still strongly advise the use of the head-rest, even for short exposures; not so much for the purpose of keeping the figure still, as for the aid it gives in posing.

The defect in the eye, just mentioned, is caused entirely by having the light too low down, so that the sitter, if he looks straight, is dazzled, and has to look aside. There is no reason whatever why there should be any light in a studio lower than five feet from the ground. A studio of the following section answers every purpose, and as the



solid walls are not less than four feet six inches high, the eye of the sitter for a Rembrandt portrait may be looking at a pleasant picture instead of a glaring light.

There is, apparently, very little glass used here, but it will be found quite enough. And if a space of clear glass measuring five feet by four feet just behind and in front of the sitter be used, the rest of the roof may be obscured, or semi-obscured, leaving the possibility, however, of letting in a little reflected light on the shadowed side of the head. The shadow pictures are very much improved if some gradation of light and shade can be obtained in the background, and fine effects can be got by turning the face from the light, and bringing it out dark against a light background.

I have incidentally mentioned the head-rest, but as an instrument of the greatest use in posing it deserves more detailed notice under the heading of these chapters.

The head-rest is chiefly famous for the unmeasured abuse it meets with from the ungrateful sitters for whose benefit it was invented. They never stop to think that it is not the instrument that is in fault, but the clumsy users of it; but I notice in my own practice that the complaints against the rest are not so frequent as they were once upon a time, and if a sitter objects to the rest, I feel certain that he has been badly treated, and had an awful experience with some other photographer, and make it a point of honour to induce him not only to submit to, but enjoy it.

The rest should not be treated as an instrument to keep the sitter still, but as a posing machine. One of the most objectonable things you can do to a sitter is to insist on his being still. You of course want him to be quiet while the exposure is going on, but this should result from your general treatment of him, rather than any preconceived notion he may have brought with him. He should be so managed that sufficient stillness is a natural result. During the few seconds' exposure that is all now necessary, a slight touch of the rest, properly applied, is enough to secure steadiness, but its great use is in making slight variations of the pose—of which, more hereafter—and the confidence it gives the sitter that he is not going to spoil your plate by moving. On the other hand, if you dispense with the rest, the sitter makes a desperate struggle to keep still, and *looks like it.* Now the portrait of a gentleman with an expression of firm determination to keep steady, as if rigidity was the one absorbing passion of his life, is not a pleasant object to contemplate.

The rest should be a comfort instead of a nuisance. It should be adjusted to the head, and not the head to the rest. It should never be applied until everything else is ready. A sitter should never have time to feel how ridiculous he looks, and the longer he is fixed to the rest, the more this feeling obtrudes itself. The plate should be exposed as quickly as possible after the rest is placed. If a slight alteration strikes you as a possible advantage, it is better to give it up than disturb the sitter at this moment; but if there is anything gravely wrong in the pose or dress, it is better to begin all over again.

The rest should be understood to be, and used as, a delicate support to the head and figure, not a rigid fixture against which the figure is to lean. The rest, as used in most studios, is a great deal too heavy. There is no occasion whatever for the cumbrous iron supports so often used. For ordinary portraiture I prefer a light simple rest without any complications—one that can be easily carried about after the sitter without trouble. I have no fixed place for the sitter in my studio, but place him in any part, just as the fancy strikes me, and it is here I find a light rest of so much use. A perfect rest has yet to be made. It must be moderately light and portable, and very simple. The complicated movements of the ordinary machines, often with chairs attached, are worse than useless, and very confusing.

ON FURNELL'S LENS.

BY W. ACKLAND.*

In addressing you this evening I intend my remarks to apply more especially to the amateur, whose equipment usually includes but one lens to reproduce all he may attempt in his photographic rambles; but I trust they will interest even the practical photographer who is armed with a whole battery of lenses.

It is well known that in order to produce pleasing results and artistic excellence in landscape photography one lens is sufficient, and even three of different focal length would be no excess. That is, a lens of short focus for buildings in close and confined situations, and another of medium focus for general views is requisite, whilst a third of much longer focal length is needed to reproduce distant objects, &c.; and any lens capable of variation in its focus so as to serve for these varied purposes would be a boon to both the amateur and professional photographer.

In April, 1883, Mr. Thomas Furnell described a photographic lens specially suitable for landscape and architectural photography, the focal length of which may be varied at will within certain limits, and which has certainly not received that attention from photographers its merits deserve.

The Furnell lens consists of a front combination of two lenses of somewhat novel construction. The outside one is of crown glass—convex on its exterior and plano on the interior; and the inner lens is of flint—plano on its inside and concave on its back surface—the plano sides of the flint and crown being cemented together by Canada balsam. Behind the front combination, and separated from it by a distance about equal to its diameter, is a double concave lens of flint glass. The most posterior lens is placed at a slight distance from the concave lens; it is of crown glass and plano-convex, and three back lenses of varied foci are supplied to complete the set. By using one or other of the back lenses, or no back lens at all, we can obtain with the half-plate lens either of the following focal lengths:—Seven, eight, nine, or fifteen inches. This lens gives a flat field, straight marginal lines, freedom from flare, covers well with stop No. 16 P. S. S. (Photographic Society's Standard), and can be made at a moderate cost.

One peculiarity of this lens is that, if the front cemented combination is well and carefully made, the posterior lenses may be of far less accurate workmanship, ordinary spectacle lenses, *if properly centred*, acting quite as well as those made with all the optician's care and skill. Moreover, the concave flint lens may be replaced by a concave spectacle lens of crown glass; and, further, the curves of the three-back plano-convex lenses may be altered to either double-convex or meniscus without injury to its working powers or disturbance of the chemical focus. In order to test its merits I have made one of these lenses with every possible care and attention in strict accordance with the author's description. In order to give an unbiassed opinion I placed it in the hands of Mr. A. Cowan, and some of the results of his trials are now before us, proving Mr. Furnell's lens to be both useful and efficient; but if you ask me if I am *entirely* satisfied with this lens, my answer would be a negative one, for its many good qualities are marred by two defects. These are—want of rapidity, and total absence of uniformity in the stops; and, to remedy these defects, I have strong hopes of shortly bringing out a lens on somewhat the same lines, under the title of compound doublet. This compound doublet will consist of one brass mount only, into which any one or two of the lenses forming the set may be screwed for use.

By varying the lenses employed we hope readily to obtain for the half-plate size either a focal length of six inches, of eight and a-half inches, or of twelve inches. These focal lengths have been selected because they are especially suitable for general use, embracing horizontal angles respectively of 65° with the six-inch, 45° with the eight and a half inch, and 31° with the twelve inch focus; and, further, with six stops it can be worked so as to give all the advantages of the Photographic Society's standard stops.

These six stops I propose to engrave as follows:—A on the largest, then B C D E and to F on the smallest. The first four, A B C D, will be 8, 16, 32, 64, when used with the twelve-inch set of lenses. The middle four, B C D and E, will be 8, 16, 32, and 64 with the eight and a half inch set of lenses; and the last four, C D E F, will be 8, 16, 32, and 64, when used with the six inch set of lenses.

Such is a rough outline of what I hope to accomplish, and all that I have hitherto done in this matter points to success at no very distant period of time. If success is gained it will be largely due to Mr. Furnell, as his writings have certainly pointed out the path by which that success can be reached.

* Abstract of a communication to the South London Photographic Society.

PRESS NOTICES OF THE PHOTOGRAPHIC EXHIBITION.

[From *The Times*.]

The annual exhibition of the Photographic Society of Great Britain will be remembered rather by reason of the generally high level of the results obtained, than for any startling novelty in the treatment of subjects or methods of work. There are, indeed, very few pictures among the thousand or more exhibited which would not have been ranked with or next to the leading productions of five or six years ago. The causes of this advance along the whole line will be found directly, to some extent, in the revolution which has taken place in the chemical processes of photography, and secondarily, and in consequence of this change, in the conditions under which the camera can now be employed, in the enrolment among the exhibitors of a largely-increased number of amateurs of cultured taste, enjoying means and leisure for the successful practice of the art. A traveller may pack in his portmanteau the whole of the apparatus he requires to photograph scenes or places he visits, and on his return home may hand the sensitive plates to a professional photographer to bring out or develop the images latent in the dry gelatine films, and to print direct from or to enlarge the pictures produced. How long the plates may be kept after exposure in the camera cannot yet be said, but, as an instance in the exhibition shows, they may safely be kept at least as long as any traveller is likely to be obliged to postpone the after processes. Dr. G. Berwick shows (481—Dumblane Cathedral) a clean, sharply-defined print from a negative exposed in July, 1880, and developed in July, 1884. Moreover, if the traveller choose his point of view well, paying due regard to the forms in which the objects before him appear to be grouped in his camera and to the position of the sun at the time—in short, to the composition and lighting of the work—he may, like Professor Donkin in his Alpine studies, return with small pictures that on enlargment are as pleasing in effect as they prove full of the most minute and instructive physical detail. While touching on the reproduction of Alpine scenery, we may conveniently direct the attention of the visitor to the set of views in Switzerland (23—The Lyskamm, Mont Blanc, Marjelen See, and Monte Rosa) by Signor Vittorio Sella, to which a medal is awarded. These large and singularly fine pictures are printed direct from the negatives taken in the Alps.

In comparison with the changes which have been made in other branches of the photographic art, the most important advance noticeable this year is in portraitnre. The greater uniformity of quality obtained by improved methods of manufacturing sensitive gelatine plates has, no doubt, something to do with this. A photographer's attention, too, is not now distracted by fears lest his prepared plate should be spoilt if he stops to improve the pose of a subject at the last moment; but with the power obtained by the use of rapidly-impressed plates of taking portraits which are more or less satisfactory, as pictures of people in their own homes, there has grown up a demand for more naturalness and ease in style. Several examples may be found in the gallery of this change, which substitutes for the plain or painted background, and the classic pillar and balustrade, or the hack table and chair, the luxury of Oriental hangings and æsthetic furniture and surroundings, with a tendency, however, it must be observed, to so fill the picture with pretty detail, that the portrait of the sitter is apt to be lost in the crowd of objects. The series of portraits of ladies (243-252), for which the judges have awarded a medal to Mr. H. S. Mendelssohn, may be cited, those of Lady Brooke and child, and of Miss Grant, as showing both the gain in freedom of treatment, and the dangers of over-elaboration of accessories. Turning to the introduction of figures into landscape and interiors, it is matter for congratulation that photographers who were tempted by the facilities new discoveries placed in their hands to essay the presentment of emotional incidents, already show a chastened ambition. Brought in as the groups of children and rustics are in Mr. H. P. Robinson's (64) "The Cuckoo," and (66) "He never told his Love"; in Mr. J. Gale's (69) "Off to Market," and (70) "The Smuggler's Cave"; and as the little girl feeding ducks is

in Mr. John G. Horsey's view of a charmingly embowered homestead (183), "The Pets," pictorial effect is heightened by the presence of the figures; and even in the cottage interior (282), "Mother's Love," a composition by Mr. J. Hubbard, which has gained a medal, the photographer is well within the bounds set him by his dependence upon the dramatic attitude of his model. When, however, he goes beyond this, and attempts the portrayal of strong feeling, as in an admirably-composed picture of a country churchyard, where a girl has thrown herself on a grave in a passion of grief, hiding her face in her sister's lap, the very realness of the scene suggests unreality and simulation, because the author of the picture has not the painter's privilege of presenting such an incident as imagined, and the mind revolts from the supposition that the camera could be turned in cold blood on a scene of such distress.

Of instantaneous photography there are many specimens, the most remarkable for artistic worth being the medal pictures (309) of yachts racing in the Solent, taken by Messrs. G. West and Son from a sailing boat, so that camera and subjects were both moving when the exposure of the plate was made. Another medal is awarded to Mr. W. P. Marsh for studies of breaking waves, and there is a well-defined and consequently apparently motionless express train, of which the picture (206) by Mr. C. Grassin was taken with an exposure of the three-hundredth part of a second. Studies of woodland, mountain, sea, and clouds are as numerous and as freshly delightful to the lover of good photographs as ever, admirable among many being (381) views at Hampstead by Mr. Edward Dunmore; (366) Rydal Water, and other views by Mr. W. Wainwright, jun.; (352) "At Home and Abroad," some Yosemite and other scenes by Mr. Andrew Pringle; (202) Bonchurch Old Church, by Mr. J. Duncan Peirce; several in a set by Captain Abney; (537) views in Surrey by Mr. C. A. Fernely; (463) North Wales by Mr. A. E. Durham; (552) The Valley of Desolation, South Africa, by Mr. R. Harris; a stormy seascape (260), "Rescued," by Mr. H. J. Godbold; and peeps into cloudland obtained by Mr. B. Wyles. Arresting attention by their delicacy of tone, the platinotype prints repay one for the close examination they invite. A medal has been deservedly awarded for a set (209 and 219-221) exhibited by Mr. H. B. Berkeley. The chilliness of a misty wintry river scene (167), by Mr. G. Renwick, is suggestively rendered by the cold bluish grays of this process, which, with quite another purpose, is no less happily suited to the copy (145) by Mr. F. Hollyer, of Mr. Burne Jones's painting, "The Six Days of Creation." Architectural work is well represented by Mr. F. Machell Smith's wondrously massive and solid-looking north portal of the cathedral at Chartres, by the marble-like brilliancy of the Rev. J. S. Knight's temples and monuments at Athens; by Mr. G. Hadley's interiors of Lincoln Cathedral; and Mr. Alfred Tagliaferro's medal picture (234) of the tombs of the Knights of Malta in St. John's Church. Mr. Henry Stevens again contributes some of his matchless studies of flowers and foliage. Of the scientific and educational uses of photography, there are examples in the microscopically small pictures on glass of Saturn's rings shown by Mr. A. Ainslie Common, F.R.A.S.; and again in the magnified photographs of sections of plant stems, parts of insects, &c., by Mr. J. Renton Dunlop, and (485) two photographs of lightning by Mr. M. Auty. Small but masterly copies of oil-paintings are shown by Mr. Edwin Cocking. Photo-engraving is illustrated by Messrs. T. and R. Annan, and the portraits of the late Duke of Buccleuch and Sir Daniel M'Nee, and the three-quarter figure of a girl, are full of promise for the future of this branch of art.

REPORT ON COMMERCIAL BROMIDE OF POTASSIUM.

BY PROF. VIRGIL COBLENTZ.*

At the suggestion of the Chairman of Papers and Queries, that samples of the same manufacturer's product should be examined at different intervals of time, samples of six American and two European manufactures were obtained in original unbroken packages in the summer of 1883; and again the same ones in the spring of 1884, this being done in order to ascertain any differences in quality of different lots issued by the same manufacturer during the year. To judge a manufacturer by the examination of a single sample would be unfair; but to examine different lots of his own make would exhibit the uniformity of his own product. Considering the quantity of material that the manufacturers turn out at a time, the two examinations within a year would no more than exhibit the variances of his products. Of the two foreign samples, one was German, the other English, both in cubes. Of the six American, two were granulated. The pharmacopœia requirements, being of first importance, are first considered; though afterwards a few unofficinal tests were also applied where it might be thought to be of some interest for comparison. The U. S. P., 1870, and Ph. Germ., 1882, tests were also applied secondarily.

Taken in this order of the Pharmacopœias, we have—

1. *Solubility.*

Soluble	1	part	in 1·6	parts of	water	U. S. P., '80 at 15° C.
,,	1	,,	200	,,	alcohol	
,,	1	,,	1	part	water	U. S. P., '80 boiling point.
,,	1	,,	1·6	,,	alcohol	
,,	1	,,	2	parts of	water	Ph. Germ. 1882.
,,	1	,,	200	,,	alcohol	

The British Ph. states it to be readily soluble in water, and less so in spirit, but does not give exact proportions.

The solubility of the samples as taken in distilled water at 212° F., and in alcohol (of 97 per cent. vol.) at 60° F. The solubility in distilled water was taken by adding the powdered salt in small portions at a time to a definite weight of water while boiling in a flask fitted with an inverted condenser, keeping the proportions of water constant; the addition was continued till the salt was in slight excess, when the saturated solution was quickly decanted from the residue, which was then thrown upon a tarred and moistened filter, dried and weighed; the insoluble residue deducted from total amount used gave quantity dissolved. The solubility in alcohol was ascertained by digesting an excess of the finely pulv. salt in 20 c.c. of alcohol (97 per cent.) contained in a closely stoppered tube, and after standing some time, during which it was frequently shaken, it was thrown on a filter moistened with alcohol, and after filtration a small portion of alcohol was added to force out any adhering solution; the filtrate evaporated to dryness and weighed.

The solubility in alcohol serves to detect only gross impurities to a certain extent, such as carbonates, iodides, free alkalies, &c. The amount of bromide itself dissolved being about 1 part in 200, the amount of impurities dissolved by the alcohol might be roughly calculated from this.

2. *Alkalinity.*—"Faintly alkaline—single crystal laid upon moistened red litmus paper should not at once produce a violet blue stain (absence of more than 1 per cent. of alkali)" (U. S. P., 1880).

"Its aqueous solution does not affect the colour of litmus or turmeric" (U. S. P., 1870).

"A few pieces placed on moist litmus should not change the colour to violet blue" (Ph. Ger., 1882).

The British Pharmacopœia mentions nothing in regard to the reaction.

The lime-water test may also be added to this, the carbonates being detected by the white turbidity occurring upon the addition of a little concentrated solution of the salt to lime-water.

Since the lime-water test does not reveal less than 1 per cent., and is sometimes less sensitive when the conditions are not closely followed, and the other tests being indefinite, a volumetric estimation of the alkali was made, viz.: 3 grammes of the dried salt having been deprived of water by ignition at a strong heat, were dissolved in about 30 c.c. of water in a beaker, solution of litmus added, and then heated to boiling, decinormal solution of H_2SO_4 was run into the liquid from a burette, until a slight excess remained after the continuance of the heat to expel the liberated CO_2, the solution being of a bright red colour. The excess of acid is then inversely titrated with standard KOH solution. From the number of cubic centimetres of acid solution, the amount of pure K_2CO_3 contained therein may be calculated, each c.c. of the normal acid solution corresponding to ·0692 grams of anhydrous K_2CO_3.

A small per cent. of alkali, though a general feature in most all the medicinal bromides, is hardly objectionable from a therapeutic point. It must, however, be remembered that the presence of any may cause incompatibilities in solutions such as contain alkaloids, iron salts, &c. In such cases, where the salt is supposed to be alkaline, it is best to be first dissolved, tested with litmus, and if the reaction be alkaline, neutralized with dilute HCl [or HBr] before adding the alkaloidal salt.

3. *Bromate.*—"If dilute H_2SO_4 be dropped upon crushed crystals of the salt, they should not at once assume a yellow colour" (U. S. P., 1880).

* A communication to the American Pharmaceutical Association.

"When its solution in water is mixed with a little chlorine, . . . chloroform agitated with it, on falling to the bottom, exhibits a red colour" (Br. P.).

"If spread in powder form on a porcelain plate, it should not be coloured yellow immediately on addition of H_2SO_4" (Ph. G., 1882).

"In aqueous solution it may also be detected by the liberation of bromine upon addition of a few drops of H_2SO_4 dil., imparting a yellow colour, which, upon subseqdent agitation of the solution with a few drops of CS_2, will be absorbed by the latter" (Hoffmann and Power, Anal.)

The U. S. P. and Ph. Germ., essentially the same, both depend on the immediate colouration of the salt on the addition of H_2SO_4; this test is practically a close one when carefully followed. Of course, the presence of this salt should always be avoided by the manufacturers, and, when present, it is there from carelessness or neglect of proper precautions in manufacture. Since the bromate is well known to be poisonous, though reducing agents do not liberate the free bromine as readily as iodine from the corresponding iodate, as might be possible in the stomach, still, as potassium bromide is generally given in much larger doses than the iodide, the presence of more than traces of bromate would render its administration inadmissible.

4. *Iodide.*—"If one gramme of the salt be dissolved in ten c.c of water, some gelatinized starch added, then a few drops of chlorine water be carefully poured on top, no blue zone should make its appearance at the line of contact of the two liquids" (U. S. P., 1880).

"A solution of the salt mixed with mucilage of starch and a drop of an aqueous solution of bromine or chlorine does not exhibit any blue colour" (B. P.).

"A solution of one gramme of salt in 100 c.c. of water should not, after the addition of a few drops of Fe_2Cl_6, impart a violet colour to chloroform" (Ph. Germ., 1882).

Bonis recommends adding a few drops of Fe_2Cl_6 to a test tube containing a sol. of KBr, and heating to a gentle ebullition, when the iodine is precipitated, while the bromine remains intact. This makes a very delicate test, even for traces. In performing the U. S. P. test, care should be taken, in adding the chlorine water, not to add too much at once, since, in the presence of the iodine, the excess of free bromine liberated may in every case mask the reaction. Advantage of this reaction has been made use of in the separation of iodine from bromide of potassium. The contaminated salt is dissolved in water, and then bromine water is added in small portions at a time to the solution heated to boiling, until it is present in excess. The solution is then evaporated to dryness, thus driving off the iodine. Iodine, though not often an impurity in bromine at present, still might occasionally occur in poor samples, and in this way enter as an iodide in the manufacture. An intentional adulteration with the iodide in any quantity is not probable, considering the difference in the market value, although some years ago the presence of iodides in bromide was of frequent occurrence in the English market—probably added for the reason that the bromide, when containing any iodide, crystallizes in much larger crystals, also enhancing the beauty and appearance of the salt.

(To be continued.)

Patent Intelligence.

Applications for Letters Patent.

13,103. Ludwig Hermann Philippi, 55, Chancery Lane, London, for "Improvements in reproducing photographs by printing, and in producing printing blocks and rollers therefor."—Dated 2nd October, 1884.

13,107. William Thomas Morgan, and Robert Leamon Kidd, 45, Southamptou Buildings, London, for "Improved means for the production of permanent or durable photographic pictures upon canvas, linen, wood, or similar substances."—Dated 2nd October, 1884.

13,156. James William Thomas Cadett, 84, Grove Lane, Camberwell, S.E., for "New or improved arrangements applicable to photographic shutters whereby the duration of exposure can be varied."—Dated 3rd October, 1884.

Patent Sealed.

4989. James Sturrock, Cashier, Dundee Advertiser Office Dundee, for "Changing sensitized plates in photographic cameras."—Dated 17th March, 1884.

Proceedings of Societies.

South London Photographic Society.

An ordinary meeting was held on Thursday, October 2nd, in the large room at the House of the Society of Arts, Mr. W. Ackland, Vice-president, in the chair.

The minutes of the previous meeting having been read and confirmed,

The Hon. Secretary stated that an engrossed memorial and a cheque for £50 had been handed to Mrs. Statham, the widow of the late president, it having been considered better to allow the family to use the amount in such a way as might seem to them best for commemorating the life and labours of the Rev. F. F. Statham. It will be remembered that the subscription originated during the lifetime of Mr. Statham, the intention being to present him with something that should serve to remind him of the regard in which he was held by the members of the Society; but on his death it was arranged to make such use of the sum as might be agreeable to the family.

A letter from Mrs. Statham, in which she expressed her appreciation of the good feeling of the Society towards Mr. Statham, was then read.

Mr. W. Brooks then took the chair, while Mr. Ackland read a paper upon "Furnell's Lens" (see page 651.)

The Chairman, in commenting upon the exceptionally interesting character of the paper, which contained much that was new to himself, remarked that the new lens was evidently one which could be made at a comparatively low price, and was probably not intended to altogether supplant the expensive instruments now manufactured by the best opticians; but the unprofessional photographer will often find the advantage of possessing the means of varying the focal length of his objective, without going to the considerable expense of a battery of good lenses.

Mr. Cowan thought the principle suggested by Mr Furnell likely to be an important one, and to illustrate the very trifling nature of the error as regards want of coincidence between the chemical focus and the actinic focus, he showed pictures of Claudet's focimeter taken at very close quarters, and it was surprising to note how little the actinic focus was affected by addition on change of the non-corrected lenses. Mr. Cowan had tried lenses built up on the Furnell system in actual work, and he was quite satisfied with the result.

Mr. J. Traill Taylor remarked that when a deeply-curved front combination is used, there is much latitude as to the back combination.

Mr. Ackland here remarked that, although his theoretical knowledge would have led him to reject the notion of making good working lenses as suggested by Mr. Furnell, he had proved by actual experiment that the arrangement possesses practical value.

Mr. Taylor pointed out that something very near to the Furnell lens was patented many years ago by Mr. Grubb; a back consisting of a positive and negative lens, the joint result of which amounted to plain glass being used in conjunction with a deep meniscus-corrected front. Morrison, of New York, also makes a lens with an uncorrected back, which may be interchanged against others.

Mr. Ackland said that flat surfaces in a photographic lens very much cheapened the cost of production, as extremely true flats are not required, a trifling convexity or concavity being unimportant; and in reply to Mr. Burton, Mr. Ackland said he did not anticipate that the Furnell system could be applied to large lenses with great advantage.

Mr. W. Cobb now observed that he had taken very great liberties with the rectilinear or symmetrical lenses of the leading makers of the present day; uniting the fronts and backs of various instruments, so as to build up a combination of the desired focus, he had found all the combinations to be good.

It was remarked that there is nothing very new in using spectacle or other lenses for modifying the focal length of a photographic objective, and that the touchstone of success in working with such extemporised instruments is the use of a small stop. With a portrait lens or other combination working at $\frac{1}{32}$ or thereabouts, very few liberties can be taken.

The meeting then adjourned until the first Thursday in November, when Mr. J. T. Taylor will give a lantern lecture on "Florida, and its Orange Groves," the illustrations consisting of some sixty photographs, which will be projected on the screen.

Some business relating to the future management of the Society was then transacted.

London and Provincial Photographic Association.

At the usual weekly meeting, Mr. A. L. Henderson occupied the chair.

The Chairman read an extract from a letter he had received from Mr. Alex. Henderson, of Montreal, in which the writer referred to a flash of pale flame following the diamond cut on a sensitive plate, which continued visible after the plate had been exposed to daylight, and again taken into the dark-room. The writer also drew attention to a part of a stereo pictures sent. The negative was taken in 1858 on a Hill Norris plate. The print had been sized with gelatine, and gum-dammar varnish passed over it.

The Chairman said he had in his possession now a print over which he had brushed gum dammar varnish, but omitted to cover it entirely. That part of the print which had not been covered with the varnish was almost entirely faded.

The Chairman showed an automatic retoucher that he had brought from America. At the end of a pointed metal cylinder of the size and shape of an ordinary pencil, was fixed a cylindrical metal box enclosing a clockwork arrangement, wound by a fixed key, which gave motion to a metal point at the tip of the pencil, forming a series of dots when held to the film of a negative. Three small buttons outside the metal case regulated the rapidity of stroke at will, or stopped the works when required.

Another American novelty referred to by the Chairman was the "Air Brush," a small machine held in the hand connected with an air pump—air from a compressed air-chamber being employed as the distributing medium, causing the liquid pigment contained in a separate receptacle to be blown in a fine spray, enabling the artist, by the angle or distance from the paper at which the machine was held, to produce the finest line or the broadest shadow with immediate effect. A specimen of the work done with the air-brush in a few minutes was passed round, showing the delicate effects and fine modelling which the machine was capable of giving in the hands of the artist (see page 370 of the present volume).

A gelatino-chloride plate developed with pyro was shown by Mr. W. A. Haddon; the developer used was the Munroe, diluted, and restrained with bromide of potassium.

Edinburgh Photographic Society.

The ninth ordinary meeting was held in 5, St. Audrew Square, on the evening of Wednesday, 1st October, Mr. W. Neilson, President, in the chair.

The minutes of last meeting having been approved,

Mr. Norman Macbeth proposed that a small committee be appointed to draw up details for a monthly competition among the members, in order to make the study of the picturesque more an object of the Society. He said:—"It would be a good arrangement for the Society if each department were kept distinct and under special committees, so that full justice be done to them respectively. For instance, I would divide the objects of the Society into three departments, viz., the chemical, the artistic, and the mechanical. I would have small committees to each, not exceeding three, and that they have no other department to occupy their mind but the one with which they were specially adapted for and appointed. In the meantime, I would press upon you the claims of the artistic department, particularly in reference to composition and effects of the pictorial. With a view to the study of this, I would propose that at each monthly meeting of the Society members bring forward some of their selected work done during the summer, that these be submitted not so much for mere criticism, but for friendly conference, that members be called upon to give their opinion as to the respective merits of each, and specially pointing out what they conceive would be an improvement. At the close of the conference, a vote by papers, numbered according to the number attached to the respective work which the members consider best, be taken. The one having the greatest number of votes to be set aside for the custody of the committee, and, at the close of the session, another vote be expressed by the Society as to the best of all that were formerly approved of, and probably some award be given."

The motion was carried, and Messrs. Norman Macbeth, Alexander Matheson, and John Simpson were appointed as a preliminary committee to consider the matter.

The President proposed that the balloting for new members be by means of tickets with the words "admit" and "reject" printed upon them, the ticket to be dropped into the ballot-box by members on entering the room. This was agreed to.

The following gentlemen were proposed as new members, to be balloted for at next meeting:—Messrs. F. W. Palmer, Edward Binning, Alfred G. Tagliaferro, and Charles Waterson.

Mr. J. M. Turnbull next communicated some notes on "Sulphite of Soda in the Developer." Having traced the history of this salt as an adjunct to the developer, he proceeded to show the reason for the contradictory evidence as to its usefulness. He pointed out the unstable character of sulphurous acid, and also of the liability of the sulphite of soda to change to sulphate. The sulphite of soda as purchased was usually strongly alkaline, and to remedy this, many people added citric acid; but this produced citrate of soda, which is a powerful restrainer, hence *sulphurous* acid should replace citric acid. By this means a reducer is formed instead of a restrainer. Sulphurous acid is, however, a feeble acid, and it required about fifty per cent. of this acid to be added to the ordinary sample of sulphite of soda to secure the desired acid reaction. It was to be remembered that the same sample of sulphurous acid was constantly getting weaker, the gas which forms the acid constantly escaping every time the bottle is opened, and therefore it is necessary to ascertain by test paper that sufficient acid has been added. When these simple directions were followed, the sulphite developer was entitled to all the praise and none of the blame that had been bestowed upon it, the development being rapid, the negatives beautifully clean and of fine colour.

In reply to a question concerning the hydrokinone developer, Mr. Hugh Brebner said he had discarded as impracticable the formula issued therewith, namely, 2 grains hydrokinone, 1 ounce water, and 5 minims liquor ammonia, as even with a full exposure he could only succeed in bringing out the very faintest of images, and that, too, after an absurdly protracted development. By increasing the proportion of hydrokinone from 0·5 per cent. to somewhat less than 2·0 per cent., he found that very great density, perfect detail, and exceptional quality could be easily produced with considerably under-exposed plates (home made). Capt. Abney, the introducer of this developing agent, claims that a 4·0 per cent. to 6·0 per cent. strength only half the exposure necessary with alkaline pyrogallol is required. Dr. Eder, again, states that "a 2·0 per cent. aqueous solution of hydrokinone, to which a few drops of ammonia have been added, is thin, but admits of silver intensification." Mr. Brebner, while regretting the limited extent of his experience, nevertheless expressed his opinion that hydrokinone promotes abnormally short exposures, great density, and exceptionally fine quality. The only drawback which he found this developer to possess was an apparently characteristic ruddy-brown colour, which, although beautiful in itself, was scarcely conducive to rapid printing. Mr. Brebner, however, deprecated the acceptance of his evidence as conclusive upon any point whatsoever.

Mr. A. B. Stewart next developed several negatives by the potash developer of Mr. Beach. He said: "For some time back considerable discussion has been going on in the columns of the Photographic News as to the merits of a developer which would seem to be, for general use, better suited to the requirements of the photographer than any other yet published. I now give a summary of that correspondence." Of the innumerable developers which have from time to time been promulgated, the principal survivors seem to be pyro and ammonia, pyro and washing soda, and ferrous oxalate. Hydrokinone I do not include, as its price, if nothing else, would probably prevent its general adoption. But to each of the developers which I have mentioned there exists some objection. The pyro and ammonia developer gives off noxious fumes, and in cases of prolonged development causes stains and fog in the negative. Of the washing soda I have had no experience, but I see from the photographic journals that complaints are largely made that the negatives produced by it are apt to be yellow. The objection to the ferrous oxalate is that it is non-elastic, there is no latitude for exposure; and, in my experience, prolonged development produces iridescence, especially round the edges of the plate. The potash developer of Mr. Beach, however, seems to be free from these objections. The published formula is:—

Pyro Solution.

Warm distilled water	2	ounces
Sulphite soda (chem. pure)	2	,,

Dissolve; and when cold add—

Sulphurous acid	2	ounces
Pyrogallic acid	½	ounce

Potash Solution.

A	Water	4	ounces
	Carb. potash (chem. pure)	3	,,
B	Water	3	,,
	Sulphite soda (chem. pure)	2	,,

Combine A and B in one solution.

For a 5 by 4 plate with instantaneous exposure, take 1½ ounces of water, 2 drachms of pyro solution, and 1½ drachms of potash solution. The advantages claimed for this developer are—that with it plates require less exposure, that it does not give off any deleterious fumes, that it does not fog or stain the negatives, it needs no restrainer, but is simply modified by dilution to meet over-exposure where necessary. Complaints have been made by some workers that this developer causes the plates to frill. I can only say that I have not found it to do so, and I do not use alum until after fixing, when I put the plates in a chrome alum bath for a few minutes. You will observe that chemical purity is strongly insisted on in the formula given, but I may tell you that in making my solutions I used the ordinary commercial qualities of the different salts, and while this may be the reason of the dark colour of my pyro solution, I do not find that the developer works any the worse. I had intended to bring plates with varied exposures, but yesterday afternoon when I began to prepare for to-night the sun had disappeared, though the air was clear, while the wind was so high that my camera would not stand without being held, and an accident to my shutter rendering it useless, I had to make the exposures as rapidly as possible with the one hand, while I held the camera with the other. My lens was an old French stereoscopic doublet, with a focus of 4 inches, and the aperture of the stop I used was ¼ of an inch in diameter for the first plate, and $\frac{1}{16}$ for the rest.

A discussion on the question, "Has the introduction of the modern gelatine dry plate been advantageous?" was to have been opened by Mr. J. Howie, who, it was understood, would have replied in the negative, but, as he failed to make an appearance, Mr. W. Crooke said that from all points of view he considered the modern gelatine plate had been of immense advantage. For landscapes and studio work they enabled subjects such as moving objects and passing expressions to be captured that could not be seized by collodion, but for reproductions of engravings and similar objects requiring strong contrasts, he believed that collodion still maintained its supremacy.

Members were reminded to send in specimens of work for the annual display which takes place at the next meeting. These should be in the hands of the Curator not later than the day before the meeting (Tuesday, Nov. 4th), so as to allow of being hung properly.

A vote of thanks to the Chair terminated the proceedings.

Dundee and East of Scotland Photographic Association.

The first monthly meeting for the session 1884-85 was held on Thursday, the 2nd inst., in Lamb's Hotel, Dundee, Mr. J. C. Cox, President, in the chair.

After the routine business had been disposed of,

The President delivered his annual address as follows:—I have no intention of giving an address; but you will expect from me a word of congratulation on this the opening night of our fifth session. Before I do so, allow me to refer—and it is with regret—to the loss our science has sustained by the death of several prominent workers, namely, the Rev. F. F. Statham, who was twenty-five years President of the South London Photographic Society; Mr. H. Baden Pritchard, editor of the Photographic News; and Mr. C. Jabez Hughes—whose names were honourably associated with the literature of photography. Of these our immediate connection lies with Mr. Pritchard, who, as you will remember, so kindly acted as one of the judges at our highly-successful Photographic Exhibition three years ago, and whose decisions gave the utmost satisfaction, and who gave a staunch support to everything tending to the advancement of photography. We cannot but lament his death. Nor can I but notice the decease of Mr. Colin Sinclair, of Edinburgh, who also kindly gave his services as judge at one exhibition. The report of this Society, which you have before you, and which I understand is to be taken as read, must, if we look back two or three years, convince us that it is thriving beyond expectation in membership, in attendance, in quality of work produced, in free offering of papers on interesting subjects, and last, but by no means least, the credit at our bankers. Not the least of our success, I may say, is due to our young Secretary, Mr. D. Ireland, Jun., who is an enthusiast himself, backed up by his friends, the Committee of Management, and the members in general. He certainly has worked well for the Society, and he means, I have no doubt, to still further increase his usefulness. I have to ask you to accord him a vote of thanks, and the same to our worthy Treasurer, Mr. J. Robertson, and to our Auditors, Mr. Baxter and Mr. Rodger. The President suggested the offer of practical lessons at a small fee, in the rudiments of photography, and closed by saying that he should also like to broach the idea of holding another exhibition.

Mr. G. D. Macdougald then read an interesting and able paper on "Chemistry and Photography," on which some discussion ensued, and for which a hearty vote of thanks was awarded.

It was remitted to the Council to make arrangements for a series of lecturettes, to be given at the monthly meetings, on different branches of photography.

An inquiry was found in the question-box as to whether better results were obtained by washing prints thoroughly before toning, and it was agreed that although the toning was quicker in the case of an imperfectly-washed print, still most of the tone was lost in fixing. A washing of about half-an-hour in the case of ready-sensitised paper was recommended.

A vote of thanks to the Chairman brought the meeting to a close.

Coventry and Midland Photographic Society.

A meeting of this Society was held on Thursday, 2nd October.

The President (Mr. Andrews) showed a very portable camera stand made out of three bamboo fishing rods, which was greatly admired by the members present on account of its lightness and simplicity of construction.

Mr. Bayntон, who had promised "Practical details on dry plate development for beginners," recommended the following developer:—

No. 1.—Citric acid	20	grains
Water	20	ounces
No. 2.—Strong liquid ammonia	1	ounce
Bromide of potassium	100	grains
Water	3	ounces

Into 2 ounces of No. 1 put 4 grains of pyro; add 1 drachm of No. 2, and immediately flow over the plate.

The meeting then adjourned to a large and well appointed dark room to witness the demonstration, which was most successful.

This Society commenced by holding its meeting in a large room at the Coventry Provident Dispensary; but, either through the meeting being too formal, or from some other cause, it was nearly on its last legs; but it is now holding its meetings at members' houses, and, with the introduction of a "pipe and glass," there is every hope of success.

Talk in the Studio.

Collodio-Chloride Emulsion and Paper.—We have received from Herr Romain Talbot, of Berlin, some samples of Risse's emulsion and paper, and find that excellent results can be obtained with no more trouble than is involved in the ordinary method of printing on albumenized paper. Enamelled paper is used, and to coat it with emulsion it is stretched on a wooden frame, and after a sufficient quantity of emulsion has been poured on, the excess is drained off at one corner. When the film is dry, a second coating is given, this time the excess being drained off at the opposite corner. The exposure required is less than that ordinarily given in the case of albumen prints, and a sulpho-cyanate bath is recommended for toning.

No. 1.—Chloride of gold	60	grains
Distilled water	3	pints
No. 2.—Pure sulphocyanate of ammonium ...	3	ounces
Distilled water	3	pints

No. 1 is added to No. 2, and the brownish precipitate which forms is allowed to remain, the solution keeping for years in this condition. To tone, one part of the above concentrated solution is mixed with ten parts of water. The fixing bath recommended is one of about half the usual strength—two ounces of hyposulphite to a pint of water.

Displacement of Chlorine by Bromine in Chloride of Silver.—In the current number of the *Berichte*, Mr. T. S. Humpidge describes a recent series of experiments relating to the displacement of chlorine by bromine in chloride of silver at various temperatures and periods of time. When using an equivalent proportion of an aqueous solution of bromine at 44·4° C. for twelve hours, fourteen and a half per cent. of chlorine was displaced.

Some Reactions of Albumen.—By E. Grimaux (*Compt. Rend.*, 98, 1336—1338).—When dilute solutions of albumen are mixed with small quantities of sodium chloride, calcium sulphate, magnesium sulphate, ammonium chloride, &c., they become coagulable by the action of heat. A similar effect is produced by passing carbonic anhydride into the solution. Albumen, as is well known, is not modified by dilution in the cold, but if the liquid is boiled, modification takes place. The author finds that if a 1 per cent. solution of albumen is heated at 90° for some minutes, the albumen undergoes complete modification. The limpid solution is not coagulated by boiling, but simply becomes opalescent. When treated with carbonic anhydride in the cold, it yields a gelatinous precipitate, which redissolves when a current of air is passed into the liquid. The precipitate also re-dissolves if the liquid is placed in a vacuum over potash, or if the precipitate is collected, washed, and placed in aerated water. Dilute acetic acid produces a gelatinous precipitate, easily soluble in excess, re-precipitated on neutralising with an alkali, but soluble in an excess of the latter. The addition of sodium phosphate prevents precipitation by carbonic anhydride, but not by acetic acid, and the solution gives all the reactions for casein. The modified albumen becomes coagulable by heat when the solution is mixed with small quantities of sodium chloride, calcium sulphate, &c. Carbonic anhydride does not completely precipitate solutions of modified albumen. The filtrate contains a peptone, and if the solution of albumen has been boiled for some hours instead of being heated at 80°, the substance precipitated by carbonic anhydride diminishes, and the amount of soluble peptone increases. It would seem that dilution dissociates albumen into free soda and an albuminoïd, which becomes hydrated and converted into an albuminate. With carbonic anhydride, this albuminate forms an unstable insoluble compound, which loses carbonic anhydride when exposed to air or in a vacuum, and re-dissolves. This last reaction is common to many colloïds.—*Journal of the Chemical Society.*

Photographic Club.—At the next meeting the subject for discussion will be, "The Collodio-Albumen Process as applied to the Production of Transparencies for the Lantern and for Enlargements." On Saturday, the 11th inst, there will be an outdoor meeting on Wimbledom Common, leaving Waterloo Station by the first train after 2 p.m. for Putney Station; to meet at the Windmill on Wimbledon Common. Visitors coming to London to view the Exhibition of the Photographic Society are invited to the Wednesday evening meetings at Anderton's Hotel, Fleet Street, at 8 o'clock.

To Correspondents.

*** We cannot undertake to return rejected communications.

Metallic.—They are due to minute particles of metal rubbed off from the paper making machinery, and reduce the nitrate of silver. We are afraid that the only thing you can do is to obtain another sample of paper.

Bromley.—Make the mucilage tolerably thick, and strain through fine muslin; then apply with a broad and flat camel's hair brush.

C. W. and S.—We think it is too late according to the regulations, but will write to you.

R. A.—We know nothing of the firm, and have no means of ascertaining, but think your fears are likely to be unfounded. The quality of the work you can do is the real point.

X. X. L.—We cannot tell you who are the makers—indeed, we have not heard of it under the name you mention; but a very good ruby lamp can be obtained for the sum you mention, at any photographic material warehouse.

F. Brown.—The simplest way is to strip it by the method of Mr. Plener (see page 122 of the present volume). 2. Remove any loosely adherent dirt by sponging the surface with water, and then copy it with a long focus lens; giving plenty of exposure.

J. M.—We understand that the manufacturer does not advertise his own address, as most stock dealers keep the goods, and he prefers to do his business through agents.

F. F. H.—(Wokington). Dammar 60 grains, benzole one ounce. Apply as quickly as possible with a broad camel's hair brush.

A. G. Levy.—1. The actual cutting down of the film is the best method in such a case, and in doing this it is often possible to improve the negative very much, when the manipulator possesses artistic skill. 2. It operates by whitening the film, and it is possible that your negative was too dense to be successfully treated by the method.

A. G. B.—It is a very excellent and well-made apparatus, and has been described in the News. We do not know of any difficulty likely to arise in using it.

H. Foss.—Write to the Meissenbach Company, Farringdon Street, London.

Constant Reader.—The chances are against it being good enough; although portrait lenses are now usually supplied with the lantern, such lenses are almost always low-priced French instruments.

C. A. M. W.—The addition of bromide is undoubtedly advantageous when the over-exposure has been considerable, but when about one and a-half times or even twice the normal exposure has been given, simple dilution is better. Of course, the proportion of bromide requires a very careful adjustment, and we shall be glad if you will send us a letter embodying the results of your experience regarding the point touched upon in the first part of your communication.

H. S.—1. It is not very well suited for portraiture, but may be a trifle better than ordinary gas light. 2. It does not appear to us that it would in any way infringe the patent. Did you notice Mr. Frewing's article on page 439? But if you gather any idea from it, be very careful to avoid accident from the arsenical fumes.

Norman May.—Thank you very much; we will refer to the matter when a suitable opportunity occurs.

Ed. V. B.—No standard of any kind is recognised, the variation being so great.

Essayist.—You will not get quite all the information you require in any one book yet published; but you might gather it all from the back volumes of the Photographic News. You had better obtain the new edition of Captain Abney's "Instruction," which will be published very shortly. Perhaps if you can get a copy of Hunt's Photography from a second-hand bookseller, it may help you.

Scotland.—The mere purchase of a negative at a sale does not vest the copyright in yourself. It is our impression that each copyright must be specially assigned, and the transfer registered.

W. W. H.—It is better, if possible, to make them of the right density in the first instance, as neither the intensification nor reduction of gelatine negatives is invariably satisfactory.

A. E.—The colours should be mixed with the varnish known as "crystal paper varnish," but they will all change under the action of light and time.

Fred. A. Bellamy.—After fixing and thoroughly washing. The proportions do not matter much within reasonable limits, as the reaction is allowed to continue until the whole of the deposit is altered.

James W. Filles.—The new edition of Captain Abney's "Instruction" will be ready in about a fortnight, and you had better wait for it.

Barton.—A mixture containing magnesium is necessarily expensive, but the following answers very well:—

Chlorate of potassium	8 parts
Sulphide of antimony	4 ,,
Sulphur	2 ,,
Magnesium dust	2 ,,

The Photographic News.

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AN AWKWARD LEAD.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1363.—*October* 17, 1884.

CONTENTS.

"THE AWKWARD LEAD," BY W. COTESWORTH.

To the non-professioual photographer, especially in England, photography owes much of its progress. To him we are indebted for the thousand and one experiments out of which the great central discoveries have grown, and, indeed, we owe not a few of the important completed processes to the indefatigable perseverance and skill of those who have taken up the art more for pleasure than profit. To the non-professional also we look for the large mass of faithful transcripts of nature that adorn our exhibitions; but we think we are right in saying that he seldom attempts what may be called the highest branches of the art, by which we mean those efforts which show the influence of imagination in choice or subject, suitable selection and arrangement of models, and the power to evoke the various shades of expressions and emotions which go to the making up of pictures in which mind, as well as skill, is displayed. It gives us all the more pleasure, therefore, to welcome pictures by an amateur in which some of these great art qualities are shown. In the present exhibition, Mr. W. Cotesworth has three pictures: "The Awkward Lead," "The Revoke," and "The Last Bit of Scandal." The first mentioned we have secured as our supplementary illustration for this week, and this admirable little picture, which might almost be called a photographic study after Meissonier, represents a party of whist players, and the costumes seem to indicate the period as that of the early part of the present century. The story is clearly told, and requires no further description; the composition is excellent, while the expressions, so difficult where various subtle shades of character are required to be shown, is perfect. The pleased, partly-triumphant, expression of the old Tabby (if we may speak of her so disrespectfully) sitting near the puzzled old gentleman, is delightful. It goes to just that point, without overstepping it, beyond which nature verges into caricature. The anxious look of the old gentleman's partner, and the calm of the lady to the left, all aid in telling the story and giving artistic variety to the group.

We understand that these pictures are Mr. Coteworth's first attempts at composition and combination photographs, and hope to see still better results from his camera.

We have one little suggestion to make which Mr. Cotesworth may find of use in making his future pictures. The nearer an object is to the eye, the clearer and more sharply defined it appears. In the "Awkward Lead" this law of nature has not been observed, as the background is in better focus than the figures. The effect would have been better if the photographer had sacrificed some definition, and kept the details of the room in subordination to the principal objects.

INTENSIFICATION WITH MERCURIC CHLORIDE AND SODIUM SULPHITE.

It is only within the last few months that it has become known that sodium sulphite (a salt which has already done good service in the pyrogallic developer) may be useful in connection with the intensification of negatives.

If a negative be bleached or whitened by being soaked in a solution of mercuric chloride, there are several reagents which may serve to blacken it; ammonia or Monckhoven's argento-cyanide of potassium solution being often preferred, because they yield delicate gradations of tint, which yield soft and brilliant prints. As a new means of darkening the whitened negative, sulphite of soda is now proposed.

Scolik, of Vienna, has made exhaustive researches with this intensifier, and he, in the *Photographische Correspondenz*, recommends the following method of working:—The fixed and well washed negative is allowed to remain in the mercuric chloride bath until the film is thoroughly whitened, the following bath being recommended:—

Mercuric chloride	1 part
Potassium bromide	1 ,,
Water...	50 parts

This solution may often be diluted with advantage, even to the extent of four times its volume of water, in order that it may not act too energetically. Still, a mercuric chloride solution made up in accordance with any other of the usual formulæ may be employed. The bleaching being complete, the mercuric solution is rinsed off, and a thorough washing at this stage is not required; indeed, the washing may be altogether dispensed with. Having now immersed the negative in a mixture of equal parts of saturated solution of sodium sulphite and water, the darkening action will be seen to take place steadily and slowly, just as when ammonia is used. No special precautions are necessary, any signs of irregularity in the action of the sulphite disappearing as the action becomes complete; and, as far as observation has extended, the negatives intensified as described are permanent.

As regards the chemical reaction which takes place, Dr. Eder gives the following particulars:—

The whitened negative contains mercurous chloride (calomel), and this is reduced to the metallic state by the sodium sulphite, just as appears to be the case when cyanide of potassium is used; thus the method now described may be regarded as analogous with Monckhoven's argento-cyanide of potassium method. Mercuric chloride is not reduced in the cold by alkaline sulphites, because stable double salts are formed; still, at a boiling temperature, reduction sets in, the mercurous chloride being first formed, and then metallic mercury. The above fact explains why it is unnecessary to wash away all traces of mercuric chloride before treating wieh sulphite of sodium.

THE DEATH OF MR. HENRY T. ANTHONY, OF NEW YORK.

On Saturday last, the 11th instant, Mr. H. T. Anthony, of New York, breathed his last, and the loss of one who has been so intimately connected with the progress of photography in the United States will be severely felt. Mr. Anthony was seventy years of age, and although he started in life as a civil engineer, he became so charmed with the Daguerreotype process on its introduction, that he finally dropped his original profession, determined to devote the whole of his energies to photographic work, and, in conjunction with his brother Edward, established the now celebrated firm of E. and H. T. Anthony and Co. In losing Mr. Henry Anthony the photographic world in the West loses one of its oldest investigators, one of its most appreciated writers, and one whose amiability of character made him beloved by all.

THE PALL MALL EXHIBITION.

Pictures and Apparatus.

second notice.

Having now noticed all the exhibits of those who have been awarded medals, perhaps the most convenient way will be to follow in the main the order of the catalogue; or, what amounts to the same thing, commence on the left as one enters the room; still, it will be convenient to go out of the regular order now and again, so as at the same time to review all the works of each exhibitor.

"Marli," a child's portrait (No. 1), by Mr. W. Slade, of New South Wales, is a pleasing study, but one cannot help feeling that it might have been better if the lens had penetrated a little more deeply into the shaded portions of the subject; and the same artist also contributes some good illustrations of Australian life, "Mending the Boat" (No. 521), and the "Pilot's Haven" (No. 532), being especially worthy of notice by the visitor. Dr. Morton had a difficult subject to deal with in taking the South Aisle and Wellington's Tomb in St. Paul's Cathedral (No. 2), but, notwithstanding this, he has obtained a very pleasing picture. No. 3, "A Portrait" by Mr. George J. Pitt, of Bethnal Green Road, is especially interesting, as showing how extremely dark the background of a portrait may sometimes be made without producing an unpleasing result. In No. 4, "On the Tyne at Bywell," by Mr. J. P. Gibson, of Hexham, we have one of those delightful combinations of cloud, water, and wood, which almost every ardent lover of his country considers to be eminently characteristic of his own native land. Nos. 5 and 6 by the same gentleman, "An Autumn Evening on the South Tyne," and "On the Allen near Staward," are productions with similar merits; but the best of Mr. Gibson's series is, to our mind, the "Blasted Oak on the Allen" (No. 7). Hartmann Koch's picture, "Schloss Hagenwyl" (No 8), would have made a more pleasing photograph had it not been taken so symetrically on the central portion of the plate; and as regards the remaining pictures by Herr Koch (Nos. 114, 115, 517, 518), it is impossible to say anything but in praise; the rich, warm, brown tone of 115, "The Roth-bach Fall," being especially well suited to the nature of the subject. Major Verney's "Studies" (No 9) is skied, so that one has to crane one's neck to look into the crowded masses of fully exposed and richly detailed foliage; and in the other exhibits of this gentleman (No. 256) "Burdunat; Roman Bridge, Bettws-y-Coed; Fairy Glen, do.; Pandy's Glen, do.; Conway;" 365, "Melrose; Penrhyn Slate Quarries," and 427, "Ripley; Wendover Manor, Chalfont," show the hand of the old practitioner, who knows how to expose for the deep shadows, and develop in accordance with the exposure. Mr. G. W. Wilson's enlarged view of the "Queen's View, Loch Tummel" (No. 10), does credit to the photographer, and to the Autotype Company as enlargers. With respect to No. 11, "Plant Studies," by Mr. B. Wyles, one can see more artistic quality than technical excellence; the backgrounds being uneven and marked in some instances. Mr. B. Wyles also contributes other pictures to the Exhibition, some exceptionally striking studies of cloud being among the number (160, 199, 229, 230, 413, 414); but the degrees of light and shade appear to us to be somewhat exaggerated, the gradations shown in the pictures extending from something very close to a jet black to a pure white. The rustic figures contributed by the same photographer also merit praise; No. 169, a woman carrying a bundle of sticks, is an effective study in red chalk; while No. 286 is a frame of pretty country views, perhaps the best being "The Minstrels."

The series of 12 by 15 views (illustrating Devonshire scenery), contributed by the School of Military Engineering (No. 12), and their "Near the Water Meet," Lyn Valley, North Devon (No. 373), show the most studiedly careful technical execution, together with much taste and judgment in the selection of good points of view. The pictures contributed by Mr. Malcolm H. Clerk tell their own tale; "The Last Bit of Scandal" (No. 13), and "A Counoisseur" (No. 14), being well worthy of mention—the facial expression of the recipient of the scandal well illustrating malicious delight in the former picture; while in the latter the attitude of the man who holds his glass up almost lovingly, is perhaps a trifle too theatrical. Mr. Clerk has other pictures: (159) "Chess," (222) "Stopped Again" (a watch), and (223) "The End of the Chapter," in which a girl is looking up a little tired, after finishing her hour's reading. No. 306 is an enlargement from No. 14. Mr. Clerk has in every case endeavoured to illustrate a sentiment or emotion by a photograph, and he deserves credit for what he has done in this very difficult branch of photography. A photographer who attempts this exceptionally difficult class of work is largely dependent on the skill of his models.

Mr. Cotesworth's "Awkward Lead," and "The Revoke" (No. 15), are so strikingly good, that we wonder their merit was not recognized by a medal. As one of these pictures forms our supplement this week, and a special article is given in reference to them, we need say no more in this place.

Mr. Arnold Spiller contributes some pleasant little pictures which he has secured during his holiday wanderings; No. 16, "The Maderaner Valley," giving a good idea of the grandeur of Swiss scenery compared with anything we can find in our island home, and indeed the same remark applies to No. 17, "Amsteg." "Luther's Window in the Wartburg, Eisenach," No. 141, has an interest for all who love to trace the springs of those revulsions of thought which have from time to time revolutionised the world. Mr. Spiller's "Misty Morning on Lake Wesen," No. 142, will hardly compare with the now celebrated photograph of McLiesh, and therefore suffers by comparison. No. 19, a quartette and three solos, is a neat little picture illustrating modern 'cycling; the quartette being a four-in-hand machine. "Where shall we go?" (No. 20) is realistic enough, and whoever has been out with a party of 'cyclists bound for nowhere in particular can appreciate the clever way in which Mr. Henry Smith makes his dumb figures speak.

Mr. J. H. Stone contributes some pictures which have more interest from a traveller's point of view than on account of their photographic merits, these being No. 21, "The Cave at Haria Lanzarote," and 254, "The Troglodyte Village of Atalaya, Cran Canaria. They appear to us to be enlargements from small and very thin originals, but we find nothing regarding this point in the catalogue, neither can we gather whether Mr. Stone is the producer of the original negative or the enlargement.

Mr. Francis Cobb only claims credit for the original negative of No. 22, "A Rustic Bridge," a charming pro-

duction, the ripple of the water and the shady nooks being admirably reproduced; while some swans and cygnets give a life to the picture which adds much to the value. The enlargement is the work of Messrs. Byrne, of Rich-

Blackheath. From an elevation of 2,700 ft. Negative by Cecil V. Shadbolt. Phototype Block by the Meisenbach Co.

"now it is done."
Negative by H. Chubb. Phototype Block by the Meisenbach Co.

mond. Mr. Cobb contributes other pictures to the show: Nos. 360 ("A Quiet Nook") and 529, the latter being a delightful series of views on the Thames.

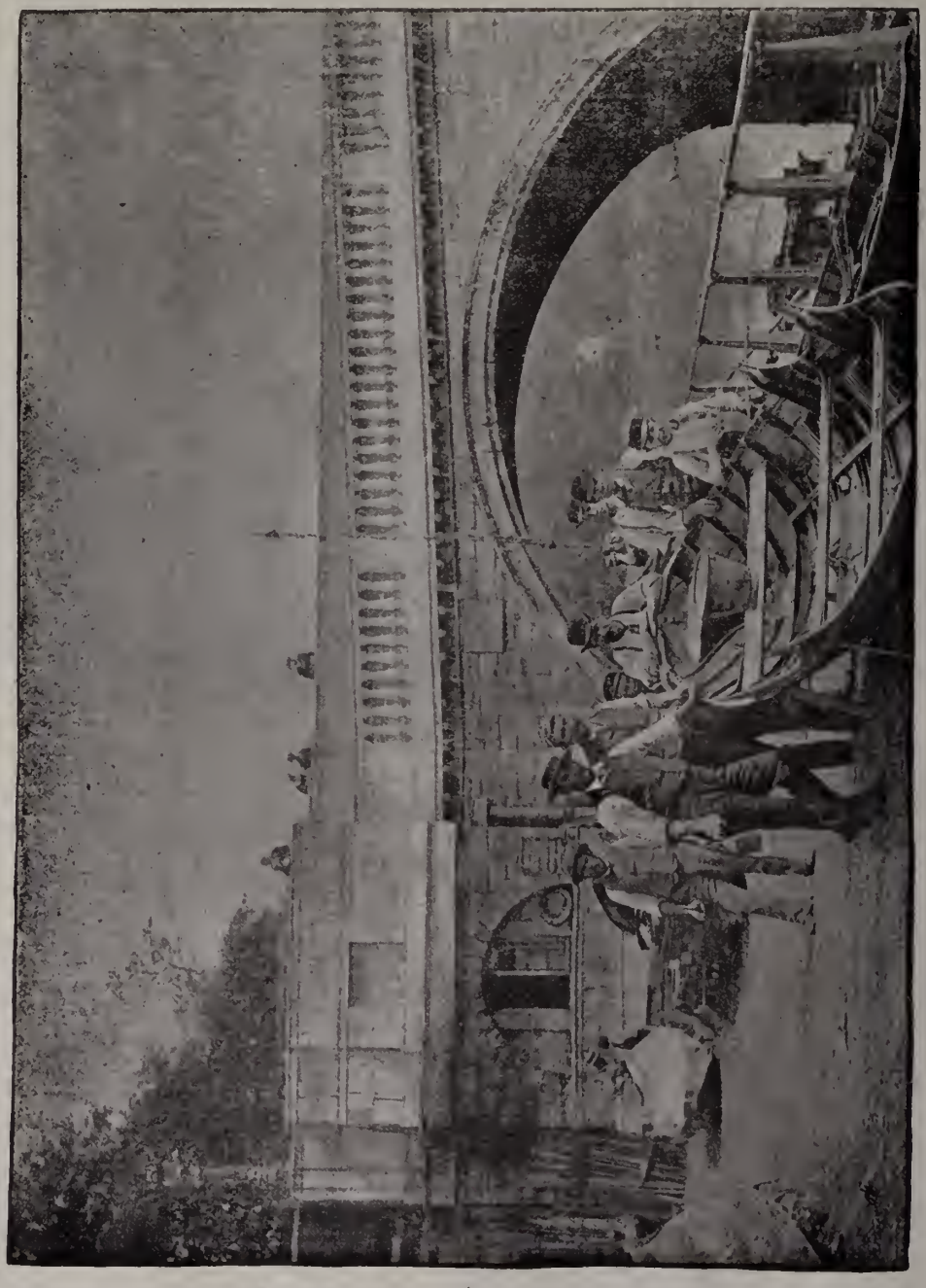
We have already referred to the Swiss views of Vittorio Sella, which have been awarded a medal; and so excellent are they in all respects, that nothing we now could say would do them justice. A picture rather than a photograph is G. Hadley's "At the Wheel," (No. 24); and the next on the list, "Dog and Cat," by Miss E. M. Cotesworth, has great merits as a composition. Puss is engaged in the agreeable occupation of drinking milk, and the dog is looking on; perhaps with a lively recollection of the scratched nose he got last time he interfered. We now come to a portrait of Miss Duppa, by H. S. Mendelssohn; but we have already noticed the works of this gentleman.

A frame of Mr. Shadbolt's photographs taken from the car of a balloon is to be found on one of the tables, and they show the decided advance which has been made by this gentleman since last year. Blackheath, from the car of the "Monarch," the elevation being 2,700 feet, is in one sense the most striking picture, the houses, streets, and gardens being shown as in a plan. The illustration which we give in no sense does justice to the original, as, curiously enough, there is an unaccountable thinness about the balloon negatives which makes reproduction by a block process very difficult. Mr. Shadbolt tells us that he cannot understand why negatives taken in cloud-land should thus differ from those made on *terra firma;* but it is a fact that they do differ.

Woolwich from a height of 500 feet, and the Royal Albert Dock from a similar elevation, are more pictorial than the plan-like representation of Blackheath, asthe

camera was only set at a small angle with the horizon. In the latter picture one can trace the windings of the Thames over many miles, while the rigging of the ships in the dock is most clearly shown.

Our illustration, "How it is done," represents the car of the "Sunbeam" with apparatus fixed in readiness, Mr. Shadbolt in the car, and Mr. Dale standing outside. The negative was taken by Mr. H. Chubb, of Chislehurst.



"WANT A BOAT, SIR? ALL READY."
Negative by Matthew Whiting. Phototype block by the Meisenbach Company.

We also illustrate, by means of a Meisenbach block, one of an excellent series of Thames views contributed to the exhibition by Mr. Matthew Whiting (No. 112). "Want a boat, sir? All ready!" said the Richmond boatman to Mr. Whiting as he approached with his camera; but Mr. Whiting did not take the boat: he took a photograph instead.

A few words more may be said with respect to the apparatus on the table, but there is really not much for us to add to our remarks of last week; the greater part of the exhibits being ordinary goods such as are sold every day in the shops, very few novelties being exhibited. We see one shutter there which has been on the table on two previous occasions, and was illustrated on p. 646 of our volume for 1882 in a notice of the exhibits of that year. This is in reality only one instance out of many in which the same apparatus is brought forward from year to year as a novelty at the Photographic Exhibition, and it is difficult to see why those whose business it is to determine what is to be admitted should not exclude everything

which is not novel, just as a picture shown in a previous exhibition would be excluded.

The *plate book* of Hunter and Sands (No. 590) is a contrivance likely to be useful, although not differing much from a plate book described over twenty years ago in the PHOTOGRAPHIC NEWS; still here we have a revival of a practically forgotten contrivance. Messrs. J. and L. Lane show slides in which the shutter is jointed in several places, so that it can be folded quite back when withdrawn—an excellent plan, which deserves to be universally adopted, as the projecting slide gets in the way of the dark cloth, and catches the wind like a sail. The flexible joint shutter is, however, not new, as Johnson adopted it in the case of the slides supplied with his pantascopic camera.

No. 602, "The Compactum Shutter," exhibited by Rouch, is a drop and flap constructed on the lines of the Reynolds and Branson shutter, which we have already fully described; but in Mr. Rouch's form the flap closes again after the drop has fallen, so that the apparatus is immediately ready for re-setting. There is also a spring permanently set for actuating the drop. This form of shutter recals an almost forgotten apparatus, the double flap, also shown by Rouch, in which two flaps are actuated by a very simple tooth gearing, as shown in the subjoined cut. The shutter of Mr. J. Furuell (No. 645) is con-

structed on an analogous principle, but with a number of complex adjustments for regulating the speed. It has already been described in the PHOTOGRAPHIC NEWS. As novelties of the year, one may mention the Godstone washing tray (625), and Marion's print washing apparatus; but as these have been already described in the NEWS one need say no more in this place. A very small metal camera made by Messrs. Marion and Co., and taking plates about an inch square, may perhaps be useful to the tourist, as it is sufficiently strongly made to stand some knocking about.

HOW TO PHOTOGRAPH MICROSCOPIC OBJECTS.

BY I. H. JENNINGS.

LESSON VIII.—PREPARING OBJECTS FOR PHOTOGRAPHY.

MANY microscopic objects are totally unfit for photo-micrography, as the beginner will soon discover if he attempt to photograph indiscriminately the objects in his collection. It does not follow, because an object looks very beautiful under the microscope, that it will yield even a passable photograph. It may look all that can be desired on the stage of the microscope; all its different parts may be defined clearly with diffused light, yet its colour, or the strong contrast of one part with another, may be such as to render a photograph of it quite impossible. Take, for instance, an object mentioned in our first lesson, the tongue or proboscis of a fly; satisfactory photographs of this object are not common, simply because they have been taken from the specimens usually met with in collections which have been prepared to give the best effect when seen through the microscope, where the strong contrast in depth of colour between the lobes of the ligula and the thick portion of the maxillae and maxillary palpi is no defect, but positively an advantage. When such a specimen is photographed, its unfituess is clearly seen; the thin, transparent lobes are usually much over-exposed long before the darker parts of the ligula have received their proper amount of light; in short, no exposure will suit this object as a whole. It is true a sort of makeshift may be employed, and fair results gained, by shading the transparent parts during exposure, keeping the shade in gentle motion all the time, during half or three-fourths of the exposure, when the whole may be exposed. It is far more satisfactory, however, either to select one of these tongues from a large number, or prepare one specially, so as to subdue these undesirable contrasts, and bring the whole object more into harmony as regards density.

The beginner in photo-micrography is strongly advised to make his own microscopic preparations. A microscope can never be much more than a pleasant toy if its possessor rely wholly on purchased slides. To own even a moderate collection of slides prepared by the professional mounter will cost a large sum of money, and when these have been examined a few times, their interest is gone, and the microscope is laid aside for want of objects to examine. But when the student prepares his own objects, his microscope becomes to him a continual source of pleasure and instruction. His slides, in the majority of cases, may not be equal to those professionally prepared, and they will certainly lack that exquisite finish which constant practice in their preparation alone can give; but for the purpose of study, and especially for photo-micrography, they may be equal to, or even better than, anything that can be purchased from the optician. Then, with practice, the student will so far improve that he will find his own preparations so much better for his special purpose, that he will rarely visit the optician's shop for slides, unless it be to purchase some object that cannot be procured elsewhere, or one which may be beyond his own powers to prepare. That there are such objects, it cannot be denied; and we may perhaps place anatomical preparations in the list of objects better left to the experience and skill of the professional preparer. As the student will not require his objects to be mounted in fancy style, he may prepare slides of such diatoms as he can find in his walks, or obtain by exchange, small as these objects are, purchasing only the rarer forms, or such as are prepared especially as test-objects. Practice in preparing and photographing minute objects, like diatoms, is not only desirable, but necessary, to give the beginner complete command over his microscope and camera.

The apparatus required in the preparation of microscopic objects is neither cumbrous nor costly. The following list includes most of what the beginner will require:—A spirit lamp; needles mounted in wooden handles; glass slides, 3 in. by 1 in. (these should be of plate-glass with ground edges); circles and squares of thin cover-glass, the thinner the better; solution of potash, commonly called liquor potassæ; methylated spirits; spirits of turpentine; some pure benzole, not benzoline; nitric, sulphuric, and hydrochloric acids; chlorate of potash; a bottle of balsam, or balsam and benzole; glycerine; gelatine; fine and coarse emery; a glass plate (preferably *plate-glass*) about a foot square, and one of cast-iron the same size, for grinding down sections of horn, bone, or rocks; a pair of scissors; a sharp knife; a pair of forceps; and a dozen brass clips for holding the covers on the slides, will also be required.

It is best to keep the balsam in a bottle fitted with a wooden stopper, through which a glass rod may be passed. The end of the rod may be kept above the balsam when not in use. When it is required to take some balsam out, the rod can easily be pushed down until it just dips below the surface, and a small quantity taken out without soiling the neck of the jar. Corks should not be used, as they are apt to stick fast, and, by crumbling away, fill the balsam with small fragments which are difficult to remove. By keeping the glass rod always in the bottle, it will remain clean, which would not be the case were it kept elsewhere; and the learner will soon find that cleanliness is absolutely necessary in microscopic work.

Newly-purchased slides and covers are always dirty. Water will not always effectually cleanse them; they should therefore be washed in a solution of caustic potash,

ammonia, or soda. This will free them from impurities; but the slides should afterwards be well rinsed in pure water, or some of the alkali will remain on the glass, and prove as great a hindrance as the dirt.

Microscopic objects are mounted in three different ways: 1. Dry. 2. In a gum, such as balsam or dammar. 3. In some fluid, such as water, glycerine, or alcohol. Dry-mounted objects being usually opaque, are not well suited for photography, unless the operator has more than common dexterity in the management of reflected light. In the case of very transparent objects, however, such as diatoms, dry-mounting is far the best, as the use of balsam or glycerine does much to obliterate fine markings, on which the interest of the object, perhaps, entirely depends. Balsam or dammar will most generally be used as the mounting medium, as these gums render an object mounted in them more transparent, and can be used in most cases where they exercise no solvent action on the preparation. Insect preparations, vegetable tissues, rock sections, crystals of various salts, are, as a rule, photographed to best advantage when mounted in balsam.

As insect preparations are of perhaps more general interest than any other, and are more easily photographed, we shall treat of preparing these objects for photography in our next lesson.

HINTS ON POSING AND THE MANAGEMENT OF THE SITTER.

BY H. P. ROBINSON.

Chapter II.—The Head Vignette.

In the last chapter I left my man hanging, while I went off into a digression on studios and head-rests, turning him, indeed—as well as my chapter—into a "subject" quite other than that intended. This is bad art. A subject should never be left suspended. Years ago there was published a series of portraits of a famous actress as she appeared reciting Tennyson's sensational "Charge of the Light Brigade," a poem utterly unworthy of the great poet's genius, but which, however, still finds listeners, if not readers. There were seven poses in all, and the last of the series left the lady with arms extended in the very ecstacy of declamation; to make the series complete, and finish artistically, the photographer should have added another picture with arms down, and left her in repose.

We will continue the consideration of how a head ought to be treated.

The first thing to decide when you see your sitter should be: "Which side of his face will make the best picture?" This consideration seldom gives an experienced operator any trouble. To one who is in the habit of observing, the sides of every face differ so much, and in such a definite manner, that a glance is all that is necessary to settle the question; but the young photographer will want to know how to select, and have some rule for the selection.

If you will look critically at a full face (or the photograph of a full face would be better, as it would enable you to measure), you will find that the eyes are not level—one is higher than the other. This is almost invariable, and is one of the peculiar instances in which nature insists on variety, even where uniformity would seem to be proper. If you take a photograph of the face in a three-quarter position, with the eye that is highest away from you, the unevenness will be still more visible; but if you take the other side of the face, and have the highest eye nearest to the camera, the lower eye will seem to fall away naturally, through the effect of perspective. The same facts apply to the nose, sometimes in a very marked degree; but it fortunately happens, in nine cases out of ten, that the eyes and nose agree as to which is the best side of the face. When they disagree, the portrait is seldom satisfactory. The two illustrations are taken from different sides of the same face, and show which side should have been taken. In the one to the right the nose looks broken, and the eyes out of line; in the other these defects are not seen.

I keep an illustrated catalogue of all the portraits I take, and on looking through several volumes, I found confirmed a very curious idea that was stated in a Note in the News. I found that about four out of five of the portraits were taken looking to the right, showing that I had in these instances chosen the left side as the best. Now, as both ends of my studio are equally well lighted, and it is no more trouble to take one side of the face than the other, it follows that, in my judgment, in four out of five cases the left side was the best. If this is correct, the knowledge of it would be of some practical use to those who have to build studios in a confined place, with only one end available, to make it that end on which the left side of the face can be best lighted.

If your sitter is not in a good state to be photographed, and if it does not endanger the loss of him (this is a purely business consideration which is out of place here), it is much better to postpone the sitting than to risk taking an indifferent portrait. The other day I saw that one of my sitters was not looking his best, and asked him if anything was the matter. "Well," he replied, "I've got a headache that ought to be good enough to split a planet into fragments, but I thought I would keep my appointment." Now it is a good thing to encourage sitters to be punctual, but I felt it right to send this one away for a day or two. My friend's description of a perfect and complete headache was as good as I had heard until another friend said he had got an effervescing mixture of sunstroke and neuralgia.

A sitter will sometimes want to be taken "naturally." His ideas of being natural—"just as I am, you know"—is to sprawl over the furniture. Perhaps he will put his hands in his pockets, sink low in the chair, and expect you to make a good head and shoulders of him. This is an awkward customer to manage. Possibly the best plan is to recommend him to go to the worst photographer he can find—one of those who advertise themselves loudly as "artists" without knowing the meaning of the word (there are plenty of them in every town)—or to the peripatetic on the sands or common, who will let him have his own way entirely, so that he pays his sixpence in advance.

But, given a decent sitter who, for the present purpose, let us say, wants a head and shoulders, what is called a vignette head, the question is, what to do with him.

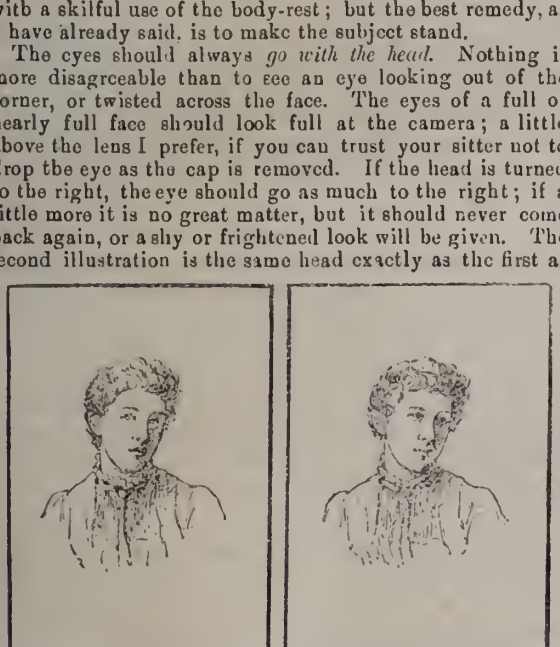
A conscientious photographer who desires to do his best, and who charges a price that will allow him to forget the cost of his materials, will in this case take at least three positions—a full, or nearly full face; a three-quarter; and, if the face will bear it, a profile, or nearly profile, showing a little of the off eyebrow; but if the side face would be too trying, then the third negative may be devoted to a variation of expression in one of the other positions.

A simple head requires to be properly composed as much as any other kind of picture, and should not be without variety of line and contrast. If with a full face the body is also turned full towards the camera, a line drawn down

the middle of the picture would divide it into two halves, as nearly corresponding as variety-loving nature will allow; but if the body is turned a little away, and the face to the camera, there will be variety of line suggesting movement and life, especially if the expression can be made to correspond. For a three-quarter face, it is better to turn the figure quite in profile, or even showing a little of the back; or the figure may be full, and the head turned away; either way will give a lively and agreeable turn to the neck. The same remarks will apply to a profile, except that there must not be too much strain in the neck, so as to pitch the head forwards, as already alluded to in the last chapter.

In a "head," the shoulders should be always nearly level, and the figure upright. It looks awkward to see one shoulder much higher than the other, when the rest of the figure is not shown to account for the position. Some sitters are obstinate about this, and will not sit upright, preferring, as they say, to feel at ease and "natural," as if it was their feelings they wanted photographed, instead of their appearance. The only remedy for a bad case of this kind is to make your subject stand. This usually improves the fall of the shadows; it is also a sovereign cure for another difficulty. Some sitters, if you ask them to sit upright, will think they are complying with your wishes if they lean back in the chair and stick their chins in the air, for some people think they are not upright until they are nearly falling backwards. This leaning back in the chair, added to too much twist to the neck, is the cause of nearly all the broken-necked effects. A good deal can be done with a skilful use of the body-rest; but the best remedy, as I have already said, is to make the subject stand.

The eyes should always *go with the head*. Nothing is more disagreeable than to see an eye looking out of the corner, or twisted across the face. The eyes of a full or nearly full face should look full at the camera; a little above the lens I prefer, if you can trust your sitter not to drop the eye as the cap is removed. If the head is turned to the right, the eye should go as much to the right; if a little more it is no great matter, but it should never come back again, or a shy or frightened look will be given. The second illustration is the same head exactly as the first as



near as I can draw it, with the position of the eyes only altered. The first is constrained and self-conscious, the other easy and natural.

Many sitters who look bright and lively when they talk, sink suddenly into the opposite extreme. As they speak the last word, their head drops, and a sort of reactionary expression comes on; this expression is as much the result of the drop of the head as the alteration in the features, and must be looked out for and counteracted. If a head-rest is used without any support to the back, this result is almost inevitable. Some photographers use a posing-chair —sometimes called a vignetting-chair—which supports the back; but I prefer to use a back rest. Indeed, I use this rest constantly, and could not do without it. The use of the rest should be a fine art.

Care should be taken to have the camera a proper height with regard to the head. If it is raised so high that the lens looks down on the sitter, the neck will be shortened, and the shoulders will appear raised. If, on the other hand, the camera is too low, the effect is perhaps still more disagreeable. The face is foreshortened from the chin to the forehead, and the nostrils are unduly visible.

The proportions of the head in a picture should have great consideration. It is too often the practice to make vignette heads much too large for the space they occupy. A carte vignette head should never be larger than $1\frac{1}{8}$ inch from the top of the hair to the chin, and a cabinet should not exceed two inches in the same dimensions.

SOME CURIOSITIES OF THE EXHIBITION.

BY YOUR OWN CYNIC.

Observing in the "Notes," in your last number, comments on the curiously narrow escape a picture had of being excluded, but which afterwards obtained a medal, perhaps you will permit me to direct attention to some further matters connected with the Exhibition that are likely to excite surprise.

First of all, it puzzles me why visitors should be troubled to look at more than one version of any one subject. I do not so much object to this when the one is the original picture, and the other is an enlargement of it, as it might show the skill of the enlarger! This is aptly illustrated by the very picture I presume you allude to in the "Notes" to which I have referred.

It is the doubles that are so annoying and puzzling to visitors. As an example: there are two pictures of a little girl sitting on the ground—about a ten by eight—one on the long wall, the other on the east wall; they are apparently identical. Both are very good, but it is possible to have too much of a good thing, and two identical pictures in one exhibition is more than the ordinary visitor understands or cares for.

Another photographer is so enamoured of a certain cathedral that, after exhibiting large pictures of it from the same point of view on two previous occasions, he sends two views of it this year, taken from the same point, or with a variation of a few yards. This year, perhaps, he wished to show the building not quite so much obscured by fog.

Yet another illustration of how an exhibitor has made the most of his negative is that shown in a picture of a man in a stagey costume drinking. To his second picture from this negative he has ingeniously given variety, not only by enlarging, but reversing it.

Then what was the meaning of the following line in the Society's circular: "Photographs coloured by hand will not be admitted"? If portrait enlargements, highly finished in water paint, are not only admitted, but hung in a place of honour on the line, after this precedent I expect to see the Exhibition inundated with highly finished water colours. Perhaps the hangers will quibble, and say monochrome is not colour.

Then, again, I am puzzled to understand the strange views that led to the selection of No. 67 for honour, whilst veritable pictures by the same masters were hung in absolute contact with it. One explanation, I have been told, is, that the majority of jurors thought more of definition than art. Is it not time that the optician's idea of a picture were given up for more valuable qualities?

Why a medal was awarded to No. 485 may prove as unanswerable a conundrum to others as it certainly did to me. Still I must confess that I am one of the unscientific: it does but demonstrate to my mind the over readiness of the jurors to assert a connection with science, however distant.

What ignorant sin must Messrs. West and Son have committed to be saddled with the awful responsibility of all the yachts scattered about the room, as one might suppose from the unrevised catalogue.

Notes.

Judging the Pall Mall pictures involves no little labour, and this is how the work is done. The pictures being all placed in position and numbered, each judge goes his rounds, and gives marks to every picture, the maximum number being ten; unless, indeed, the judge considers a picture so bad that it ought not to have been accepted, when he marks his disapproval by giving no marks; but when he is decidedly of opinion that a photograph should be awarded a medal, he of course gives it the full number—ten.

All the markings are then collated and added up by the officers of the Society, and the rest is simple, all that is required being to determine the standard, above which means success, and below, failure.

As we have already stated, the judges this year are Messrs. Glaisher, W. Bedford, Donkin, W. England, J. E. Mayall, Mayland, and Pringle.

That several of these gentlemen would have been medallists this year, had not their works been out of competition, is hardly a secret, as some of the best pictures in the room are contributed by them.

Not only do the judges thus forego all possibility of gaining distinction, but they have to brave the displeasure of such demonstrative non-medallists who write to them and enquire the reason why.

A correspondent writes:—"Have you tried the following clearing solution? It is very efficient, but do not use it over and over again, as if so it will clear so well that the image disappears altogether in ten minutes or so:—

Alum	1 ounce
Citric acid	1 ,,
Sulphate of iron	3 ounces
Water	20 ,,

When freshly made, this clearing solution has but little action on the image, but as oxygen is absorbed from the air, and the proto-salt is converted into a per-salt, the solution becomes capable of dissolving the reduced silver with tolerable rapidity. If used when old, its action must be carefully watched.

Such as may wish to figure as photographers, and yet do no photographic work, have now great facilities offered them in the United States, as plates which have been exposed at the Niagara Fall, the Yellowstone Park, and other great tourist resorts, can now be purchased to hand. He who is anxious to wear the photographic laurels in the circle of his immediate friends has now only to buy the exposed plates, take them to one of those persons who make a business of developing, and finally order the required number of prints. Even the possession of a camera is not essential; but it looks very much better to have one.

Those who are behind the scenes, however, tell us how the "ready-exposed plates" are manufactured. A number of plates, alternated with sheets of black paper, are placed on a table in the dark-room, and a transparency—say, of the Horse-shoe Fall—is laid on the top. A wax match is now struck, and allowed to burn itself out while held at a distance of about a foot from the top of the pile. The exposed plate and the underlying sheet of black paper are now removed, and the next plate is exposed.

The "Universal Column" which they talk of erecting at Lucerne is to contain relief portraits in bronze of all the illustrious men and women of the present time. In fact, the proposed column is literally the "tallest" thing in albums yet projected, the proposed height being 300 feet.

Still, if the Committee wish to be well up with the progress of the nineteenth century, the portraits should be photographs. Let us suppose photo-enamels made upon porcelain tiles. If more realistic productions are required than flat pictures, it would be quite easy to superimpose the photo-enamel picture on a relief tile cast from a Woodbury relief.

Walzl's Monthly remarks that it is not gratifying for a maternal parent to bring a squalling brat into the studio with the remark, "I guess you'll have lot of trouble; Mr. Johnson, the photographer, tried her twenty times—but, there, he was so bad tempered that I'll never go near his place again!" You feel for your rival, Johnson, as you never did before.

There seems an energetic search now after antiseptic substances, but there does not seem to be much practical gain by adding to the already long list. It is, however, interesting to note that, according to Professor Dewar, one part of peroxide of hydrogen in ten thousand of a putrescible liquid will prevent the development of bacteria. Although the peroxide, if in strong solution, is instantly reduced by most organic matter, a small trace can consist in solution along with easily reducible organic bodies.

If all be true as reported, the photographing of the Treaty of Tientsin has hoisted the Chinese on their own petard. The story of the Chinese journal, Li Hung Chang, is that certain erasures were made in the document of Captain Fournier, and were initialled by him. Now that a copy of the photograph has arrived in Paris, it is urged that the erasures and initials have been forged by Li Hung Chang. Captain Fournier has yet to make his statement, and if this statement corroborates the assertion of forgery, the Chinese Government will wish they had not employed the science of the barbarian. Probably it has also been described by Li Hung Chang, who perhaps did not think the document would be copied so exactly.

It may be that the belles of Long Branch are not photographed, since freckles, which nature imparts to blonde beauties only as a rule, are fashionable; and those who

cannot get them naturally, resort to art. The artificial freckle is produced by the application of moistened sand just after rising in the morning, and the charge is fifty cents per freckle. However charming freckles may look in real life, they are hideous when photographed. Photography must be at a low ebb at Long Branch.

To multiply the skulls of deceased celebrities, as is the case with Oliver Cromwell's, of which at least two "guaranteed" originals exist, is perhaps carrying realism rather too far; but there is certainly no reason why every provincial museum should not vary its inevitable collection of local fossils. New Zealand war-clubs, mediæval cannon balls, and British birds'-eggs, with facsimiles of "Magna Charta" (say) and the "Bill of Rights," and selections of the most generally interesting of those unique M.SS. and autograph letters which are to be found in Great Russell Street in such profusion.

To take the most recent case. A year ago the country gave £40,000 for a collection of M.SS. known as the "Stowe Papers." "Where," to parody Hans Breitmann, "are those papers now?" The irreverent wag might reply: "Stowed away!" and the irreverent wag would be about right. But if the most interesting of the M.SS. were reproducted by photography, the whole nation might soon be benefiting by its acquisition, and what is surely intended for the instructiou and edification of the people would not be persistently pigeon-holed.

It is satisfactory to learn that the trustees of the British Museum intend to strongly represent to the Treasury the desirability of establishing a photographic department in connection with their national storehouse of literary and artistic treasures. As it is, but a ridiculously inadequate sum is included annually in the British Museum vote for photographic purposes; the result being that it can only be tentatively and sparingly used. But, as Dr. Garnett pointed out in the admirable paper he read to the Library Association at Dublin the other week, the utmost facilities should be afforded for photographing literary and artistic objects, so that *facsimiles* of precious manuscripts and of priceless *chefs d'ouvre* might be produced for the education and delectation of the millions who can never hope to visit our great central libraries and museums.

There is, indeed, but little new under the sun. A correspondent writes to inform us that five or six years ago he had a number of photographic visiting cards prepared for him on the plan recently suggested in these columns. In the left-hand corner of each card was affixed a small oval photographic likeness of himself. He tells us that at the time several of his friends followed suit, but that the idea never became generally fashionable.

All the same, it is easy to see that its introduction would be in many cases most useful. What person is there that is blessed with a large circle of acquaintances who does not now and then find among the cards left during an absence, several bearing names which he is temporarily unable to associate with any actual personality? If, however, they had only had some photograph in the corner, no doubt as to the identity of their names would have arisen.

The Smiths, Browns, Joneses, and Robinsons would find the photographic visiting card especially convenient. As it is, they are driven—in order to preserve their identity—to resort to all kinds of curious expedients. Those Smiths who do not turn themselves into Smyths, or Smythes, or Smits, find it necessary to hyphen themselves on to some such high-sounding denomination as Clavering, Montgomery, or Ponsonby to prevent confusion, reckless of the extra trouble they thus inflict upon themselves for life in the shape of elongated autographs.

Patent Intelligence.

Applications for Letters Patent.

13,317. James Thomson, 21, High Park Street, Liverpool, for "Improvements in photographic cameras."—Dated 8th October, 1884.

13,318. James Thomson, 21, High Park Street, Liverpool, for "Improvements in photographic cameras."—Dated 8th October, 1884.

13,371. William Charles Hughes, Brewster House, 82, Mortimer Road, Kingsland Road, N., London, for "An improved form of lantern front for magic-lanterns."—(*Complete Specification*).—Dated 9th October, 1884.

13,372. William Charles Hughes, Brewster House, 82, Mortimer Road, Kingsland Road, N., London, for "An instantaneous mechanical frame for the rapid change of pictures in the lantern."—(*Complete Specification*).—Dated 9th Obtober, 1884.

Specification Published during the Week.

10,226. Benjamin Joseph Edwards, 6, The Grove, Hackney, in in the County of Middlesex, Photographer, for "Changing the slides or pictures in the magic-lantern, and for exhibiting dissolving views with a single lantern."—(*Complete Specification*).—Dated 16th July, 1884.

The invention relates to a method of, and apparatus for, exhibiting a series of slides or pictures in the optical instrument commonly known as the magic lantern, and has for its object the changing of the slides or pictures mechanically by one movement of a lever or handle without any movement being perceptible upon the screen.

In order to accomplish this object I first shut off the light, and consequently the picture from the screen, by gradually closing or covering the front lens or objective of the lantern, and during the momentary interval of darkness thus produced I rapidly change the slide or view, and substitute another one previously placed in position, and then by gradually uncovering the lens I allow the new picture to fall upon the screen.

In carrying out this my invention in the simplest possible manner, I fix a short rod or spindle, turning on its axis parallel to the optical axis of the lantern, and which spindle is rotated by a handle or lever. At the outer end of this rod I attach an opaque screen projecting in front of the lens so as to cover or close it, a certain portion of the screen being cut away, so that during a part of the revolution the lens is uncovered, and the light, and consequently the picture, is allowed to fall upon the screen, and by means of suitable excentric gearing I connect the rod, carrying this opaque screen to a swinging or sliding frame, carrying two slides or pictures arranged in such a position in the frame or carrier that when the lens is not covered by the opaque screen or dissolver, one or other of the pictures shall be rest in its proper position in front of the condenser, and I arrange the gearing or excentric motion so that the sliding or swinging frame shall be set in motion and the picture changed during the momentary interval of darkness caused by the passage of the opaque part of the screen or dissolver in front of the lens. In order that the darkening of the picture shall be

gradual I make the aperture in the dissolving screen with serrated edges; but I prefer, instead of this revolving screen, to close and re-open the lens by means of two thin sliding plates or diaphragms working in grooves attached in front of the lens, and I make the sliding plates with both ends concave, and I suspend these plates by means of a cord passing over and once round a drum or pulley fixed to the rod in place of the opaque screen before described. One of these plates being attached to each end of the cord, they balance each other, one rising and the other falling as the drum revolves. I make the plates of sufficient width to cover the opening of the lens, and of sufficient length to keep the light entirely shut off during the time the position of the slide carrier is being changed; and I arrange that when the upper concave edge of the rising plate comes in contact with the drum, the lower concave end of that plate is just free of the upper edge of the lens, while the upper concave end of the falling plate is just clear of the lower edge of the lens. For holding the slides or pictures in position I use a double carrier of the usual construction, but arranged by means of guides or runners to travel easily in metal grooves attached to a second frame, which is firmly fixed in the lantern immediately in front of the condenser. The slide holder or carrier, carrying the slides or views, is moved from side to side by means of a lever slotted at its lower end and working on a pin fixed to the central division of the double slide holder; the upper end of this lever is firmly fixed to a rod or spindle turning on its axis and placed parallel to the spindle carrying the drum before described.

SCRAPS FROM MY HOLIDAYS.

BY H. ARNOLD BEMROSE, M.A.*

My reason for taking up the art of photography was because I wanted lantern slides to illustrate subjects for lectures which were not to be found in any maker's catalogue. My first attempts, not of a very artistic character, were made with a rough camera composed of a wooden box, a dark slide, and the objective of my sciopticon lantern. This summer I took with me to Dolgelley, in North Wales (in addition to a half-plate camera, the negatives from which I have not yet developed), a sciopticon camera for plates 3¼-inches square, which, with lenses and four double dark slides in case, weighs about four pounds. I took also Mr. Smith's Brattice and Manx stands, each weighing about 1 pound. The former I found very useful for hill work, especially in climbing Cader Idris. In such cases the stand becomes an alpenstock, and is not an useless weight for the time, like a folding one is.

The object of my holiday—not forgetting, of course, fresh air and exercise—was geology, and not photography, and most of the photographs I took were to illustrate that science. During the fortnight I walked 250 miles, collected over a hundredweight of specimens, and exposed 25 plates. The weight of the camera was of some importance to me. Four pounds is quite enough on a hot day on rough ground, in addition to several pounds' weight of iron in the hammer and chisel, and that of any specimens brought home. I found no difficulty in the packing of plates either before or after exposure. The plates were the Manchester rapid ones, which were taken in the boxes as supplied by the maker, and after exposure were replaced in a similar way. The changing I did under the bed-clothes at night, wrapping each box up carefully in non-actinic paper, numbering each box, and taking notes of the plates replaced, so that on my return home I was able to pick out any plate required for development.

A few of my transparencies were printed on gelatine-albumen plates (Chapman's); but the majority on Edwards' gelatino-chloride plates. They were exposed by contact with the negatives to a bats-wing burner, at a distance of two and a half feet. The exposures varied from five to fifteen minutes. And here let me point out, in passing, what probably most photographers know, that light varies inversely as the square of the distance, so that an exposure of twelve seconds at a distance of four feet from the light would be equivalent to one of three seconds at a distance of two feet. A short calculation will enable us to obtain the same results from different distances with the same exposure, as we can from different exposures at the same distance from the light; so that, instead of varying the exposure, we may vary the distance, thus saving time.

The developer used was the one supplied by Edwards—a long exposure and weak developer giving reddish tones; a short exposure and strong developer rich black tones—the latter making, I think, the best pictures.

The remainder of the time was spent in showing the transparencies with the sciopticon lantern, and explaining them, and in exhibiting the camera and stands.

* Notes of an address to the Derby Photographic Society.

ON CHEMISTRY AND PHOTOGRAPHY.

BY MR. MACDOUGALD.*

The science of chemistry is that which takes cognisance of the combinations of matter. One would imagine that this science must form a most important item in the education of a photographer, as he uses chemical substances to a considerable extent. As a rule, however, it does not. Photographers, apparently, speaking of them as a body, have no inclination to understand the minutiæ of chemistry. This disinclination may be the result of a widespread opinion that a knowledge of chemistry is not necessary to the production of a good picture. A week or two ago, in one of the photographic journals, a writer gave it as his opinion that, in order to excel, photographers should not trouble over the minutiæ of formula, or about any technical part of photographic work. To strengthen his position, he remarked that the true artist never condescended to paltry matters of that kind, but rather accepted materials put to his hand, and questioned nothing. This gentleman instanced the old painters taking their painting material as they found it, their main object being to put colouring material on their canvas in a particular way.

Now, while we might all agree with this writer when he says that the main object to be kept in view by the painter or the photographer is the putting on of colours or the printing of lights and shadows in a particular way, it would manifestly be absurd to say he is not to trouble himself about the underlying technics. I doubt not, if we could get close up to the back window where Raphael or Rubens was working, we might find these gentlemen very busy with other implements than the brush and canvas. There is no reason to doubt—nay, I have good reason to believe—that these good old painters made, mixed, and ground their own colours, and paid a very great deal of attention to the medium through which they were to give to the world their thoughts and ideas. We may well imagine their fear of colours fading or darkening.

The absurdity of the position is increased when applied to photography. If photographers in past years had taken processes and material as they found them, and remained content therewith, where would our art-science be in this year of grace? A more than ordinarily enterprising man might possibly be trying to take instantaneous photographs on Daguerreotype plates; but this, perhaps, is not what our friend means. Photographers should be graded. First, there would be the great photographer himself—the idealistic and ethereal. He would be surrounded and possess large and small satellites such as the camera-maker and the plate-maker, whilst such operations as printing, toning, fixing, and mounting would be done by obscure persons. He, the great, would sit in the centre of all, not dirtying his hands in the slightest, but devoting his whole energies to the production of ideas. In fact, this gentleman wished the term "photographer" to apply only to the man who searches out good combinations, makes good grouping, or has a knowledge of what does and what does not form a good pictorial landscape—just such an individual as would get his man John to inform him what lens to screw into the camera to suit a particular view; who would get John to estimate the light and the number of seconds necessary for exposure; who would further cause John to make plates, develop plates, to print, tone, fix, and mount; and, finally, to put into a frame the finished result for the exhibition wall as photographed by his august master. It would be very wrong to say that John in this case was better than his master, unless we knew if an equal power was possessed by John of finding or making good subjects, in which case he would be distinctly better than his master.

And this leads me to the subject of the evening—"Chemistry and Photography." Should a man who essays photography know something of chemistry? Is a knowledge of the science a help or an encumbrance to him? An answer which will satisfy every case must be carefully framed, and to that end I would divide photographers into two great classes—the photographer whose

* A communication to the Dundee and East of Scotland Photographic Association.

sole object is to make and multiply pictures, who does not care very much about the means by which the pictures are made; and the photographer whose object is not only the making of pictures, but, in addition, the making of new and superior methods of operation.

To the photographer who simply makes pictures, chemistry is not of much benefit; for chemistry, although it has to do with combinations, will not enable an operator to combine a number of individuals into a good group, or to combine a tree and a mountain to form a good landscape. To the other photographer chemistry is of importance, as it enables him in some measure to intelligently examine already-known phenomena, and prevents him from making absurd blunders or advocating absurd theories, as is too frequently the case amongst his other brethren. As an instance of the little, yet aggravating mistakes sometimes made: the other day I learned from a friend that he had left for ten days some fine plate glass amongst a strong solution of caustic soda. He told me he did not know what had happened, but the glass was marked and spoilt, and had lost its polish. The real state of matters was simply that my friend had unwittingly made a partial solution of his plate glass, glass being appreciably soluble in caustic soda.

Then, again, we are all more or less troubled with the very active man who rushes into print with a new idea, and supports it with a flow of language of astonishing abundance and acrimoniousness. We do not require to go far to find instances. A writer in one of the journals not long ago asserted that light reflected from an orange surface affected a gelatine plate to a greater extent than light from a blue surface, and actually went the length of asserting that experiments supported him. Little matters of this kind are continually cropping up, showing the value of a knowledge of natural philosophy and chemistry to the photographer.

On the other hand, too much should not be expected from chemistry. When anything out of the common occurs during some of the processes connected with photography—such as some blotching, staining, or other occurrence entirely unexpected—chemistry more than points to a probable cause. The science for the moment might appear to be at fault, may be able to do very little—not because the blotching or staining is caused by something outside the domain of chemistry, but simply that the cause is so occult, so intangible, as to be difficult of approach.

Photography is an art above all others which is based upon occult or semi-occult causes. The whole art has always appeared to my mind to be a good example, in a chemical sense, of what Professor Tait, of Edinburgh, calls an incalculable machine—a machine whose motions, although following strictly the usual lines of cause and effect, are quite incalculable owing to the occult nature of the causes regulating its motion.

To illustrate more fully what I mean, we may instance an egg balanced on end near the edge of a table. This is a possible feat, especially if the egg be rough, and the place very still and free from vibration. Even if the feat were impossible, we could imagine such a state of matters. All conditions remaining the same, the egg will remain in position, and neither fall on the floor or turn over on the table. But on the slightest disturbance from without reaching the egg—if we as much as look at it, to use an expression—the egg will in all likelihood either fall to the floor or turn over on the table. We have reason to believe—nay, we know to a certainty—that the falling to the floor, or the simply turning over on the table, is the result of a specific cause; but that cause is so inappreciable in itself as to elude the most careful observation. The most careful scrutiny of the surroundings of the egg would not enable anyone to predict which way the egg would fall.

This balanced egg may be likened to some of the conditions surrounding the chemical substances used in photography. In their constitution they are so delicately constructed, and so easily, so to speak, put off their balance, that it would require almost superhuman intelligence to predict what amount of force would put them off their balance.

Some of the actions which take place are beyond prediction and calculation, and the science of chemistry is able to give explanations, the value of which only amounts to probability.

PRESS NOTICES OF THE PHOTOGRAPHIC EXHIBITION.

[From *Society*.]

A cynic has said that war has one advantage—it is a great teacher of geography. True; but we might possibly have been as happy had we never known the exact whereabouts of Isandlwhana, Majuba Hill, and the Ityosi River, were rather shaky about the boundaries of the Soudan, and given to follow the example of our nearest neighbours and put down every place outside our ken as *là bas*. But even Jacques Bonhomme is rapidly learning—possibly by the time his lesson is finished, every *pion* in France will have been so taught by the *pion-pions* that he will be able to set down China from Hong Kong to the Great Wall on the big blackboard for the benefit of the young Republic. But we would wish to learn geography without the necessity of a "big butcher's bill"—the Iron Duke used another adjective. An apt teacher is at hand in the person of the artist whose palette is a "dry plate;" who scales peaks, dives into volcanos, ascends in balloons, canoodles down strange rivers, and visits strange people who have no manners, and whose customs are nasty; to set out before the stay-at-homes the result of his travels, and expound for their benefit a royal road to geography. His armament looks warlike, but he may say in the words of the Irish photographer, when his patient thought he was taking aim with murderous intent, a natural conclusion if he had the rare good luck to be an Irish landlord, "It isn't yer life, but yer focus I want." The knight of the camera is ubiquitous; he follows our armies; he makes long journeys for himself; he establishes himself in yachts; as a merchant captain he varies the monotony of taking the meridian by taking a photograph; he is a magician who has a Djin at his command to take down a picture in less time than old-fashioned fogeyish Puck ever dreamt of. If words fly, and the writing remains, how much more durable is such a record as Mor Déchy—the Hungarian traveller has taken of the great group of the Central Caucasus; in the course of his explorings ascending such a peak as Adai Chocb, of no less a height than Mont Blanc; taking in slopes, snow-clad peaks, glaciers and moraines, by which his comrades of the Alpine Club may take notes for future ascents.

It is for this reason that we learn so much, and learn it so pleasantly, that the annual display of the Photographic Society of Great Britain, at the Gallery, 5a, Pall Mall East, is one of the most enjoyable exhibitions of the season. This year the effect of the gallery taken *en bloc* is excellent, whilst, after a close examination *en détail*, the favourable impression is maintained. Each year some new wonder of the camera is shown; instantaneous views, even though taken in the 300th part of a second—as this "Express Train," which seems to stand still, of M. C. Grassin, of Boulogne, or this Quai Gambetta, with its mixture of white-capped *poissardes* and "ditto"-suited tourists, taken on the instant—amaze us no longer. But the energetic secretary, Mr. Edwin Cocking, is a man of "reserved force," ready to spring a mine on you and surprise you at any moment. The surprise this year is, he shows you a small plate of glass, with some still smaller plates attached. You take your magnifier, and each tiny morsel resolves itself into Saturn and his ring, Jupiter and his moons, taken by what magic who can say, by A. H. Common. What would Albert Smith have thought of this when he chaffed amateur photographers in his Mont Blanc, and showed a blank piece of paper as a representation of Cologne Cathedral at midnight? I remember seeing a portrait of him and his wife, Miss Mary Keeley, taken on the Mer de Glace; it was certainly not what Mr. James Whistler would term a harmony in black and white; there were no half-tones, figures black, ice dead white. With such an idea in your mind, compare such pictures as this "Mont Blanc" and "Monte Rosa," by Vittorio Sella, the "Weisshorn" with its peak fissured with ice, from the Täsch Alp, by W. F. Donkin, or the dreaded "Matterhorn, from the Höuli," and note the delicate half-tones, the cleverly-taken foregrounds, the artistic knowledge that is brought to bear.

Another veritable surprise is two photographs of lightning which quite upset the idea of forked lightning cutting across the sky in a series of sharp angles. M. Auty sets each flash before us lighting up the darkness of the night. Each is shaped like a bow; each starts from what gardeners would call two "tap roots," and in each the angles are much smaller and much less acute than we have been accustomed to believe. So much for the surprises; and now to a section which interests all men and women in their habits as they live—the clever and the stupid, the known and the unknown, the pretty girl and the lady whose sole remnant of the days of her "gyurlhood" is a chronic simper—simper faithfully caught, not a grin, but a Mariana at the Moated Grange expression, a kind of "he cometh not," a sort of desire of the moth for the star, a facial rendering of gather ye rosebuds while ye may; but, sad to say, the flower, the gilded youth, the golden nobs, to speak pomologically, of the day, will

not stop to cull is the wallflower of the ball-room, and a decided wallflower hangs on these walls. Let the reader or visitor seek for himself, "*Cherchez le chat*," "*Où est le lapin ?*" as the backs of the tickets of the Seine *bateaux-mouches* ask us.

Firstly, amongst the portraits, one that should be hung in the place of honour, not put on one side on a screen, is that of the evergreen President of the Society, Mr. James Glaisher, seeming as if he had found the fountain of eternal youth in his recent run through Canada with the British Association, and looking "Ready, aye, ready," for another seven mile ascent with Mr. Henry Coxwell. This by Mr. J. E. Mayall. Then Mr. Bergamasco of St. Petersburgh, Abdullah Frères of Constantinople, Luckhardt of Vienna, or Sarony of New York, would surpass this lifelike portrait—a portrait which gives not only the man, but the man behind the mask, by Mr. Valentine Blanchard, of Mr. Andrew Levey, the clever *marechal du baton* of the Lyceum, or rival in delicacy the soft whites and tender fleeciness of the dress of this lady in "The Siesta." Here is a portrait enlargement by the London Stereoscopic of Sir Joseph Porter, K.C.B., beaming on us as if no oyster crossed in love had ever interfered with his digestion. Then, of course, we have that very much photographed lady, Miss Maude Branscombe, but, as Audrey said, "the gods be thanked," no professional beauties advertising the merits of some new dresses. Mr. H. S. Mendelssohn contributes a charming series of charming faces, amongst which I would note a platiuotype of the Lady Brooke and two exquisite portraits of Mrs. James. All Mr. Mendelssohn's portraits are marked with rare refiuement. "Love me, love my dog," might be said of this enlargement by the Woodbury Company of a negative by MM. W. and D. Downey, a picture in neutral tints. Mr. T. J. Dixon, who may be styled photographer to the Zoo, presents us with a regal-looking "Imperial Spanish eagle," an eagle that looks a survival of when the red and yellow flag, with the shield of Leon and Castille, floated over a New World, and when her galleons and caravels swept every sea.

If I mistake not, the gelatine process was first taken up by an amateur. How it has spread may be guessed by the fact that the catalogue tells us, "All the original negatives of photographs exhibited this year were taken on gelatine plates, the exceptions only being noted," aud the exceptions are few and far between. As Mr. Vernon Heath has shown conclusively, each enlargement of a gelatine plate displays some new beauty, some delicate half-tone, whereas the old collodion enlargements were blurred and woolly, as if Brobdignagian spiders had been weaving their webs in mockery over the work. To turn to the travelled thanes who have sent in exteriors and interiors from every part of the civilised globe. These views are naturally taken small ; how admirably they are enlarged is told on these walls. Here is the "Church of the Knights of Malta," an enlargement after the negative by Signor A. G. Tagliaferro, with its wealth of ornament, its altar with massy silver candelabra, its carved stalls, its Renaissance panels, its treasures of the silversmith's art. It is well Malta is English. Were these treasures the property of any church in Italy they would every one be marked, their weight taken in an inventory, ready to be a prey to the looter wheu Italian finance is at as low an ebb as Italian statesmanship. Here, by the same artist, is another interior of the Church of S. John, with the tombs of the bygone Knights of Malta, some of whom had gone in battle with the Paynim Turk for the defence of Rhodes. "The Knights are dust, Their swords are rust, Their souls are with the saints, I trust." Pass from this treasure of church architecture to this Troglodyte village of Atalaya, Gran Canaria, by Mr. Stone, both the works of man. This autotype enlargement of the Rheims Cathedral, that has seen the crowning of all the descendants of S. Louis, this ruin of Raglan Castle, this North Portal of Chartres Cathedral, by Mr. Machell Smith, and these Athenian views by a chaplaiu in the Royal Navy, the Rev. J. S. Knight. The temple of Æolus, the Parthenon, the Tomb of Cecrops, copied in the Vestry of S. Pancras' Church, and the Erectheum, survivals of when Grecce was the mistress of all arts, the brain-ruler of the world.

Nor is the present forgotten. The Stereoscopic Company have taken down every nook and corner of "Old Londou" in the Healtherics to survive when its six months' life is ended. One word on interiors. Why does not Signor Tagliaferro set down with his camera the church of Monreale in Sicily, the grandest Byzantine shrine in the world, to which Ravenna, and even St. Mark's, must pay homage ?

Now for a hasty flight over a wide field, that travelled by the camera. The School of Military Engineering shows marked improvement in such works as this. Lynmouth and the picturesque Lyn Valley, the old tower painted by so many an artist ; Surrey Scenery, such as John Linnell loved ; Surrey Lanes, by Mr. H. E. Moberley ; Surrey Woodland Scenery, by Mr. T. M. Brownrigg ; Bettws-y-Coed, and all the spots kuown to the tourist, to say uothing of the artists, where easels arc set as closely together as the auglers in Mr. Deney Sadler's "Pegging-down Match" ; those by Capt. Abney, R.E. ; the Cherwell and Magdalen College ; Mr. Arnold Spiller's Souvenirs of Luther, including his window in the Wartburg, Eisenach ; Shipping at Rochester, Coonish Coves, Thuringiau Forests, the Lake District, our old abbeys, Melrose, Jedburgh, and Tintern. Such a delicious glen as "Near the Waters-meet, Lyn Valley," by the School of Military Engiueering ; Views in Londou, such as these by Messrs. York and Son, which set us thinking where can they be ; and such South African scenes as this Easter Hunt at Wycombe, with the caravan setting out, the motley groups of hunters and natives, the camp fire and the trophies of springbok, elands and two-pronged deer ; finally, the surf boats of Port Elizabeth, or these Bird Islands, Algoa Bay, or this Valley of Desolation, Graaf Reinet, all by Mr. R. Harris. "The Effects of the Earthquake at Colchester, 1884," by Mr. John Spiller ; the natives—for all who live at Colchester must be "natives"—seem very proud of having had an earthquake all to themselves. Certainly, if this view is to be credited, it did no harm to the Old Castle. Finally, some instantaneous bits : "Folkestone Boat entering Boulogne Harbour," by M. C. Grassin ; and Breaking Waves at Bognor, and Giant Breakers, marvels of technique, by Mr. W. P. Marsh, and some of Mr. W. England's too seldom exhibited "Views in Switzerland," clear and bright as the air of the Higher Alps.

Amongst what may perhaps be best termed "Genre" subjects I would note Mr. Val. Blanchard's imposing and truthful "Message from the Sea," with the old salt looking at the last remains of the dinghy, the board which bears the name "Concord"—an epitaph, it is to hoped, for those who have found peace and rest beneath the waves. Mr. H. P. Robinson, the founder of this school, is naturally present in a number of studies, oue of which, "The Mill Door," two donkeys being laden, gained the medal, and another, which I prefer for its unforced humour, "He never told his love" : an old fellow with a merry twiukle in his eye, who sits on a stile chaffing some laughing girls. This "Last Bit of Scandal," with the figures in Second Georgian costumes, by Mr. Malcolm H. Clerk, and "The Awkward Lead" and "The Revoke," exceedingly humorous, and Fred. Barnardesque, by Mr. W. Cotesworth. Amongst sketches, Dorothy Vernou's Room, the Steps at Haddon Hall, and the postern from whence she eloped with handsome Robert Manners, and added Haddon to Belvoir Castle, by the Hon. Mrs. Holden Hambrugh, must uot be forgotten, or this "At Rest in the Desert," outside the Biskra oasis, enlarged from a uegative by the late H. Baden Pritchard. What would Aristophanes have said to these photographs of his Birds taken after the performance at Cambridge, November, 1883 ? Surely tho merry old Greek would have chuckled, and made Mr. R. H. Lord the subject of a new character.

But space warns me. I would but mention some artistic lily screens and daintily taken flowers, by Mr. F. Hollyer, the æsthetic photographer, who admirably reproduces in all but the glowing glory of colours, tones and tints ; "The Six Days of Creation" of Mr. Burne-Jones, and some excellent photographs of oil paintings by the indefatigable secretary, Mr. Edwiu Cocking.

[From *The Builder.*]

It is curious to observe how completely "your photographer" neglects architecture as a rule. Of the nearly 600 plates exhibited, not one represents an architectural subject properly so-called ; there are a few commonplace street views, and that is all. Yet there is no subject for which photography is more eminently suited than the reproductiou of architectural detail. In the Photographic Exhibition, takeu generally, there is doubtless much good technical achievement ; yet how dull is the interest excited by these microscopically perfect reproductions of form and detail in nature, as compared with that aroused by the imperfect works usually exhibited in the same room. In the one case we place between us and nature a chemical machine ; in the other case, a sensitive human mind and hands. In a certain way the balance is in favour of the human agency, even in regard to verisimilitude. The instantaneous photographs of breaking-waves and sea-spray, for instance, do not, somehow

look like sea. A painter would convey the idea of motion; modern photography, by its very perfection of instantaneous imprint, loses the motion, and gives us a rigid mass thrust permanently up into the air. The effect is curiously seen in a photograph of an express train, taken in the 300th part of a second. The train appears to be standing still. A photograph of lightning, which is shown, still retains the idea of motion; lightning is too quick even for the photographer. The scientific value of photography is finely shown in some photographs of magnified objects, sections of parts of plants and insects; but in regard to the representation of natural scenery, the failures of the painter are worth more than the successes of the photographer, even apart from the question of colour.

Correspondence.

MORE PLATES FOGGED BY THE LEATHER HINGE OF THE SLIDE.

Dear Sir,—Last Thursday a gentleman called on me and asked me to develop a plate for him, as he thought there was something wrong with his dark slide. I developed the plate, and found a dark band on the right hand side of the plate about 1½ inch wide. On returning it to the dark-slide, I found that the mark corresponded exactly to the leather used for hinging the shutter of the slide. The leather smelled strongly, and had imparted a slight fog to the whole plate. The plate had remained in the slide for about one month, but during that time it had not been exposed to any white light. I was informed that the plate, if only kept in the slide for a short time, was all right; but if kept for two or three days, the band of fog was sure to appear

The camera makers should be more careful in selecting the leather they use for their slides, and save plates being condemned through no fault of the plate maker.—I am, sir, yours truly, J. D. England.

[Camera makers might do well to use vellum for making the hinges of their slide shutters. The way to make a vellum hinge may be learned by inspecting the inside of a pianoforte.—Ed. P. N.

THE PHOTOGRAPHIC EXHIBITION.

Sir,—In the *Times* report of the Photographic Exhibition, there is an observation which opens up a question of some importance in the interest of fairness. In this report it is suggested that the traveller may hand his exposed plates to a professional photographer to develop and print. Possibly this is often done, but in what sense can anyone so doing lay claim to the results? If the plates are bought ready-prepared, and are afterwards developed, printed, and mounted by professional hands, the amateur has had nothing to do with them but the exposure. This may be a matter of little or no importance until such pictures are offered for competitive medals, or for the honour of a place in the Exhibition. In this case, does the Society require some distinct guarantee or declaration that the person exhibiting has had more to do with the production of the pictures than the mere exposure in the camera?—I am, your faithful servant, Sacerdos.

THE POTASH DEVELOPER.

Dear Sir,—I have just received your issue of 22nd Aug., and in it I read Mr. Jennings' letter about the potash developer. As I have lately been trying this developer (Newton's), you may perhaps care to hear what the result has been with me. I entirely agree with Mr. Jennings in all the advantages he attributes to it. It is a quick, powerful developer, and gives very bright, clean negatives. It can be used of even greater strength than that recommended for instantaneous pictures; but for ordinary exposures I find half strength, or even weaker, is an improvement. Plates at all prone to frilling seem more liable to do so with this developer than with the pyro and ammonia developer; but the alum bath between developing and fixing is a remedy for that. I have just been down to Bombay on leave, and while there, I took some instantaneous street views. I am sending you half-a-dozen prints, on which I should be glad to have your opinion. They are the first pictures of this kind I have tried, and the way I managed was as follows. I fixed the focus of my lens for an object at about a medium distance from the camera before starting, and then, getting on to the top of a cab, drove down the streets; and when I came to any spot that took my fancy, and looked as if it would make a picture, I held up the camera, looked over the top of it, and, when I thought I had got it square on the object, fired away. I developed the negative on my return here with the potash developer, full strength as recommended by Mr. Newton.

A professional printer would produce better results, as I am not great at printing; but perhaps you will be able to judge of the negatives from what I send.—I remain, yours faithfully, M. W. Hooper, Lieut.-Col.

Bangalore, India, Sept 12.

[The pictures sent by our correspondent are of the first order, well graduated, and vigorous; while the absence of any want of sharpness where pedestrians are shown in the act of crossing in the immediate foreground shows that the exposures must have been exceedingly brief.—Ed. P.N.]

THE DUBLIN EXHIBITION.

Sir,—Your remark in this week's "Notes," relating to the date fixed for the above, is a most natural one. Permit me, however, a word of explanation. In making our arrangements we were not entirely free agents, because, but for the courtesy of the Royal Hibernian Academy in lending us their rooms, we could not have held the Exhibition at all. Hence we were obliged to fix the date to suit the Academy's convenience more than our own. As a matter of fact, we have had a large measure of support from English and Scotch photographers, and scarcely anyone has objected to the date clashing with that of Pall Mall.—Yours truly, Greenwood Pim.

Monkstown, Dublin, October 13.

Proceedings of Societies.

London and Provincial Photographic Association.

At the weekly meeting of this Society, held on the 9th inst., Mr. W. Ackland occupied the chair.

The Chairman read a medical certificate he had received from Mr. Ashman, who, in consequence of a severe attack of bronchitis, was unable to be present to give his lecturette on Toning fixed for this night.

The Members, in expressing their great regret at Mr. Ashman's illness, decided that the lecturette should be postponed to Thursday, the 23rd inst.

Mr. Teasdale (a visitor) showed some transparencies he had made on bromide plates, which he had been very successful with—the developer used was the ordinary ferrous oxalate—also the results he had obtained on some chloride plates made by Mr. Cowan.

A Member, who had been recently making transparencies, asked what was the best paper and mountant to use for this work.

Mr. Henderson had found a needle paper answer the purpose.

The Chairman used a dark French paper.

Mr. G. Smith used a mountant of gum and sugar. The strips of gummed paper for binding the transparencies were cut an inch longer than required, and drawn over a postage stamp damper; by this method the fingers were not soiled or made sticky with the gum.

Mr. Barker used a mixture of flour paste and gelatine boiled to the consistency of size; the addition of ammonia improved its keeping quantities.

Mr. Teasdale remarked that he had been for some time past much interested in the making of transparencies, and referred to the difficulty he experienced in getting perfectly flat thin glass

for this purpose, and also the needle paper referred to; he had used the gum and sugar, but preferred a weak glue, this admitting of a stouter paper being used; but it had the disadvantage of requiring to be made hot on each occasion of using it. Instead of the ordinary paper biuding for transparencies, he suggested using a plain preserver, such as is used for glass positives, if a manufacturer could be induced to make them for the purpose. Mr. Teesdale also referred to a paper that had been used in 1862, similar to, but more yellow in appearance than, the present albumenized paper; this was sensitized on a 60-grain bath. After printing, the paper was immersed in cold water. A tough film floated off, which could be floated on to a glass plate. He had found this an exceedingly easy way of making transparencies. On his return from abroad the paper was no longer in the market, and he had failed to obtain it anywhere since.

Mr. Henderson agreed as to the convenience of the preservers, as the glasses could be easily separated should occasion require removal of any dust, &c., from between them.

The Secretary read a letter he had received from the Edinburgh Photographic Society, asking the members of the London and Provincial Association to act as judges in a competition of pictures fixed for the end of the month.

The Members willingly agreed to this, and the Secretary was instructed to reply to this effect.

The ordinary business of the meeting being over, Mr. A. L. Henderson invited the members present to an adjoining room, where an excellent supper was laid. After full justice had been done to the good things put before his guests, and the Chairman had proposed the usual loyal toast, Mr. W. E. Debenham proposed the health of Mr. Henderson, congratulating him on his successful tour in America, and expressing the pleasure the members of the Association felt in giving him a hearty welcome back. The toast was enthusiastically responded to by all present, Mr. Henderson replying to same. The toast of the visitors was proposed by Mr. A. Haddon, and replied to by Messrs. Teasdale and Harrison.

Songs and recitations were contributed by Messrs. Cobb, Cowan, Rymer, Harrison, and Briginshaw, some humorous original verses by Mr. W. Cobb causing much merriment.

Sheffield Photographic Society.

The annual dinner and meeting took place at the Masonic Hall, on Tuesday, the 7th inst., Councillor J. Firth in the chair, when a very good muster of members sat down to a plentiful and well-selected meal, which was followed by the usual yearly routine of discussing and passing accounts, and electing new and re-electing other officers. In the statement of account, the most notable item was a rather serious loss on the last exhibition, which was held in January of this year.

The following officers were elected for the ensuing year:—

President—Mr. W. B. Hatfield.

Vice-Presidents—Councillor Thomas Firth and Dr. T. H. Morton.

Treasurer—Mr. T. S. Yeomans.

Secretary—Mr. J. Taylor

Council—Messrs. Bacon and Turner.

On leaving the chair, Mr. Firth spoke of the prosperous condition of the Society, notwithstanding the loss on the exhibition.

Mr. Hatfield, on taking the chair, said that it would be his study to maintain the interest and improvement the Society was now making.

The subject for this month's competition was the best picture of "Clouds," and was won by Mr. Turner.

Mr. H. Rawson brought a very rich print and negative of clouds, which called forth great praise.

Mr. Turner had a number of good pictures of his summer's work on the table.

The subject for the November meeting will be "Enlargements by Artificial Light on Argentic and other Sensitive Paper," by Mr. Foxon.

Leeds Photographic Society.

At the last ordinary meeting held on Thursday, Dr. Thorpe, F.R.S., in the chair, there was a good attendance of members. The following gentlemen were elected members:—Sir Percy Radcliffe, Rev. C. Courtenay, Messrs. T. W. Harding, and R. T. McKay.

Messrs. S. Marshall and T. Dawson were elected auditors.

A large number of prints from negatives taken at the out-door meetings were exhibited by Messrs. Teasdale, Ramsden, Ward, Denham, McKay, Bothamby, and Pearson.

Dr. J. Walker exhibited a changing-bag of simple construction, but most efficient, which elicited much admiration.

Mr. Branson exhibited a number of lantern slides, to show the effect of introducing sulphite of soda into the soda developer.

Mr. Pocklington exhibited a lantern slide toned with gold, in which the foreground was a brown colour, the trees and middle distance green, while the sky was a light blue. Mr. Pocklington promised details of the process when he had made further experiments.

Messrs. Reynolds and Branson exhibited a new dark-room lantern with special features, which will meet with the approval of amateurs.

Mr. Teasdale, referring to the manner in which exposed plates were packed by some of the members previous to development—*i.e.*, face to face, without anything between—suggested that it was possible by this means some of the plates might become more or less fogged, basing his opinion on the fact that plates wrapt up in paper that had recently been exposed to a strong light exhibited traces of fog.

Dr. Thorpe was of opinion that the suggestion made by Mr. Teasdale was of great interest, and trusted some of the members would make experiments so as to thereby test it. He informed the members of the Society that a committee had recently been appointed by the Leeds Philosophical Society for considering the question of pushing the interests of meteorology in some way, and he asked the attention of the members of the Photographic Society to this subject, as he thought they might be able to derive some method of determining the amount of solar energy day by day. What was required at present was not any delicate and intricate apparatus, but, until their knowledge was more advanced, some simple rough-and-ready method would be most useful. He mentioned several actinometers that were in use, and trusted the members would interest themselves in the matter.

Several members made suggestions, and a general conversation ensued.

Derby Photographic Society.

The ordinary monthly meeting was held at the London Restaurant, Irongate, Derby, on Wednesday, Oct. 1st, Mr. Richard Keene in the chair.

The minutes of the previous meeting having been read and confirmed,

Mr. H. Arnold Bemrose, M.A., Vice-President of the Society, gave an address entitled "Scraps from my Holiday," (see page 666), which he illustrated with lantern transparencies by means of the Sciopticon lantern.

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

The report of the sub-committee appointed to consider the conditions of the subjects for study was, after a few slight alterations, adopted, the last day for sending in the prints being fixed for December 10th.

Mr. W. Haslam was elected a member of the Society. A cordial vote of thanks to the Chairman brought the proceedings to a close.

Bolton Photographic Society.

The annual meeting of this Society was held at the Baths, Bridgman Street, on the 2nd inst., Mr. E. N. Ashworth in the chair.

The minutes of previous meeting having been read and confirmed, the following annual report was read:—

"In presenting their fifth annual report, your Council desire to congratulate you on the eminently satisfactory state of the Society. During the year 1883-4 there has been a large increase in the number of members, and at no time since its formation has the Society stood on a sounder basis. Your Council are happy to state that the balance in the hands of the Treasurer is steadily increasing. The following demonstrations have been given during the season:—'On toning and fixing silver prints,' by Mr. Parkinson; 'On enamelling silver prints,' by Mr. J. Taylor; and one on the "Development of platinotype prints," by Mr. C. K. Dalton.

"Lantern exhibitions have been given by Messrs. W. Banks, R. Harwood, and T. Parkinson, and have undoubtedly added to the attractiveness of the Society.

"The annual open meeting was held in April last, at the Baths, and was in every sense a success.

"Your Council have again to regret the meagre attendance at the out-door meetings; in fact, there has, strictly speaking, been only one meeting held during the summer months, although the weather has not been unfavourable. It is hoped that efforts will be made to render these meetings more attractive, and so secure a better attendance."

The Report having been accepted as read, a vote of thanks was passed to Mr. Hicks, and regrets expressed as to his retirement from the Presidency of the Society. Mr. Hawksworth having also desired to retire, the thanks of the Society were tendered for his energetic and valuable services as Honorary Secretary.

Messrs. Paitou and Taylor examined the voting papers, the following being the result:—

President—J. A. Bridson.

Vice-Presidents—Harwood, Ashworth, Parkinson, and Hawksworth.

Council—Banks, Taylor, Knowles, and Slater.

Treasurer—J. C. Sewell.

Hon. Sec.—C. K. Dalton.

On the motion of Mr. B. Abbott, a vote of thanks was passed to the retiring Council for their services during the past year.

Photographic Society of Ireland.

A meeting was held in the Royal College of Science, Stephen's Green, on Friday, the 10th inst., Mr. Greenwood Pim, M.A., in the chair.

The minutes of the last meeting having been read and confirmed,

Mr. A. G. Tagliaferro, of Malta, was elected a member of the Society.

The following names were proposed for membership:—S. Geoghan, C.E., H. Magee, and Francis S. Hall.

Messrs. Samuel Baker and Thomas Curtis were elected to audit the yearly accounts before the next meeting.

Mr. C. W. Watson gave an account of his recent trip to Derbyshire with the camera, and exhibited a large number of excellent views taken during the tour.

Mr. George Mansfield showed a series of 10 by 12 views, which he had recently taken in France and Spain, all of which were much admired for their artistic and technical merit.

Mr. J. V. Robinson showed a patent instantaneous shutter, the invention of Mr. F. W. Monsell, a member of the Society, and which formed the basis of a varied and interesting discussion on shutters in general.

Mr. Thomas Mayne exhibited a new expanding camera of great length, suitable for copying, &c.

Mr. John L. Robinson's paper, "A Week in Suffolk," was by consent postponed until that gentleman's return.

The proceedings were then adjourned until the 9th November, when the annual meeting will be held.

St. Helen's Association of Science, Literature, and Art.

Photographic Section.

A meeting of this Section was held on the 17th ult., Mr. Heather in the chair.

Mr. Bewley showed a number of views taken at Betts-y-Coed during the month; part of these were toned with platinum.

Mr. Sherlock said he preferred to use the platinum bath, as he could get as great a variety of tone with it as with gold, and the cost was only a quarter that of the latter metal.

Mr. J. F. Houghton showed a number of lantern slides of local scenery. Two (Chapman's albumen), developed by the pyro-sulphite method from a formulæ given in "Marion's Photography," were especially praised for their clearness. The rest were developed by Cowan's solutions; these tones were much admired.

Mr. Thomason showed a number of lantern slides of some very pretty views near Buxton.

Mr. Heather showed about twelve prints toned with a solution made up of perchloride of iron, nitrate of silver, and hyposulphite of soda. The tones varied very much; some, however, had a very pleasing effect.

Mr. Taylor enquired if the prints were as permanent as the ordinary ones; he did not consider they would be, especially in a town like St. Helens.

Mr. Heather said his experience was limited to the few prints he had shown; he fully endorsed Mr. Taylor's remarks. Mr. Heather then showed two negatives, one fogged, the other quite clear. He explained that while cooking the emulsion, he found a series of small holes in the can, and consequently the emulsion was fogged. Mr. Heather then placed it in a ten per cent. solution of bichromate of potash for fourteen hours; after this treatment it was quite free from fog, but was considerably slower.

After a discussion on emulsions, developers, &c., the meeting closed.

Amateur Photographic Association of Victoria.

The monthly meeting was held on Monday, 1st September, at the Royal Society's Hall, Mr. E. C. Bell, Vice-President, in the chair.

The minutes of previous meeting were read and confirmed, after the election of new members and the nomination of two others for membership.

Mr. Baker demonstrated the method of using Warnerke's sensitometer. He showed several of the sensitometers, and it was remarked by some of the members that if all those which are manufactured are equal to the samples exhibited, very little reliance can be placed upon them for comparative tests, as the density in no two of them was similar. When the development of the best plates was commenced, similar complaints were made by many of the members as to the careless coating of many of the makes of gelatine plates which reach this market, some samples issued from the factory of a well-known English maker being conspicuous for uneven coating. It was jocularly remarked by one member that gelatine emulsion must be exceedingly cheap, or the manufacturers could never afford to coat the backs of the plates as freely as they do the faces, without extra charge, which is very often the case.

The result of the tests showed that some of Mr. Baker's make of plates registered as high numbers as the best makes of English plates which were tried.

The lecturer afterwards exposed and developed several opal plates of his own make, and a great deal of information was given; after which the meeting closed.

Talk in the Studio.

The Exhibition of Inventions, 1885.—Those who may wish to exhibit will be interested in knowing that applications will be received up to November 1st, the time having been extended. As a feature is made of photographic apparatus in the classification, it is to be hoped that all important steps made since the last great exhibition will be properly represented. Pictures as pictures are not to be admitted; but as illustrating a process they will be received. Forms of application for space may be had from the Secretary, Inventions Exhibition, South Kensington.

A Journal Illustrated entirely by Photographs.—Herr Wilhelm Hoffmann, of Dresden, has issued the first number of a monthly magazine, "*Das Universum*," which is illustrated entirely by means of the collotype process. In the first issue there is an instantaneous picture by Auschütz, and four other photographs.

The Northampton Exhibition.—Notice should be given by intending exhibitors before the 1st of November. Forms of application for space may be had from Mr. H. Manfield, The Museum, Northampton. Nine silver medals and sixteen bronze medals are offered.

New Panoramic Photographs by Mr. Gutekunst, of Philadelphia.—We have received two remarkable panoramic pictures of the kind for the production of which Mr. Gutekunst has made himself so celebrated. One represents the new Susquehanna Bridge, and a train of cars ready to cross; while the other is a picture of the "Back Saddle Curve" on the same line. The pictures measure 16 by 48 inches.

The Use of the Royal Arms.—The case against Messrs. A. and G. Taylor (see p. 634), which was adjourned from the 30th ultimo to Tuesday last the 14th instant, was again adjourned, and came on for hearing on Wednesday last, and the magistrate, after some unimportant remarks, inflicted a fine of one shilling and two shillings costs. The prosecution was founded, it will be remembered, on the 106th section of the new Patent Act, which came into force on the 1st of January, 1884, and in connection

with this enactment the *Solicitor's Journal* remarks:—"It appears to us that the harassing of tradesmen who cannot produce an authority for using the royal arms is unjustifiable, for no one is, or could reasonably be, deceived by such use into believing that a shop keeper 'carries on his business by or under the authority of Her Majesty, or any of the Royal Family, or any Government department.' Everyone knows that the use of the royal arms by a shop-keeper means nothing at all. The real object of the enactment was supposed to be to prevent patent agents from using the royal arms on their offices and paper, so as to lead people to believe that their advice was given with the authority of a Government department; and if employed for this purpose only, the provision might have been valuable. But to attempt to extend its application to cases in which it is of no importance to any one, whether the arms are used or not, is absurd." It is stated that Messrs. Taylor Brothers intend to appeal on the ground that they have been actually photographers to the Queen during the past fifteen years.

Photographing an Actress.—It was manifestly unfair on the part of an American photographer to take a certain actress much appreciated in her own country by surprise, and obtain a portrait of her just as as she was stepping, dripping wet, out of the sea to regain her dressing-box. The lady of whom a mean advantage was thus taken had refused to be photographed, with a determination that baffled the endeavours of New York photographers; her reason being that she objected to see her likeness in every shop window she passed. Finding her inexorable, it was resolved to have recourse to an expedient, and one member of the profession, ascertaining that she was spending a few days for the purpose of bathing at San Francisco, followed her there with his apparatus, put it in a bathing machine, and obtained what he wanted, unknown to the *artiste*. Shortly afterwards she received a polite note containing her portrait as she emerged from the waves, and the intimation that ten thousand of the same would be put on sale the following day unless she consented to allow herself to be photographed in more becoming attire. The actress talked, in the first moment of irritation, of appealing to the police, but on reflection she considered it wiser to capitulate, although her annoyance is extreme at the unfair proceedings of her persecutors.—*Evening Standard.*

Reactions of Silver Cyanide.—Professor C. L. Bloxam describes in the *Chemical News* a series of experiments on the effect of nitric acid and the alkaline carbonates on precipitated cyanide of silver. This salt is completely dissolved by boiling in nitric acid, with the production of hydrocyanic acid and silver nitrate. If the solution be decanted off before the action is complete, minute needle-like crystals are deposited on cooling. The crystals prove by analysis to have the composition $AgCn2Ag NO_3$. Precipitated silver cyanide, when treated in the cold with a strong solution of sodium carbonate, becomes granular. Under the microscope the edges of the granules exhibit minute needles. On boiling, the salt becomes grey, and with the exception of a trace of metallic silver, all is dissolved. The solution, on cooling, deposits a mass of needle-like crystals, which prove to be pure silver cyanide. The conversion of amorphous cyanide of silver to the crystalline takes place more readily with potassium carbonate than with the sodium salt.

Photographic Club.—On the 22nd inst., the subject for discussion will be "Reversed Negatives." All notices affecting the annual general meeting must be made on or before the 22nd inst.

To Correspondents.

*** We cannot undertake to return rejected communications.

Ebbw Vale.—Until the thirteenth of November.

Enquirer.—1. The best solvent is crude benzole or light coal oil. 2. Silicate of soda 1 part, white of egg 5 parts, water 60. Beat to a froth, filter, pour on the glass, and allow the excess to drain off. Some prefer to rinse the plates with water after the substratum has dried. The syrup is not satisfactory.

Amateur Photo.—The gentleman you name has no claim to be considered an amateur, as his photographic views are sold in Regent Street and elsewhere.

James J. Walker.—1. The single lens will do, but where accurate focussing is required, it is better that both instruments should be identical. A lens of inferior quality would not be quite satisfactory, and we think that you had better call upon the maker of the instrument, and see if you can make any arrangement for him to construct what you require.

M. E. T.—1. Your work is rather too pronounced; that is to say, you have done too much on the prominent features, and not sufficiently removed the irregularities of texture in the face. Take prints from the negative occasionally as you go on, and study the general effect. The retoucher who can most adroitly flatter vain sitters is most appreciated, and if you wish to succeed you will have no alternative but to accommodate yourself to circumstances. 2. Yes, but probably not just yet.

E. and L. Lander.—There is no list kept, but each is announced in the Photographic News as particulars reach us.

F. Francis.—All depends on the style of the work, but about half-a-crown would be near the mark if well done.

Chestrian.—Nothing can be done but to clean off the films.

J. B.—We think not, unless the quantity is so great as to retain moisture.

An American.—If you will send us your address, we will forward you some of the photographic journals published in the United States, so that you can gather information from the advertising pages.

Henry Spink.—We do not know the nature of the composition "finally adopted" by the gentlemen you name, but will do our best to find out what is really best for the purpose. These particulars, together with the address of the gentleman you name, shall be posted to you.

Rev. W. A. C. A.—Thank you for your communication, which touches on an important point; but we are not sure whether we can make use of it this week.

H. J. H.—1. Yes, if you adopt the method of Mr. Pleuer. See page 465. 2. Either the first or second. 3. The old process will give much finer results in skilful hands, but much more work must be done to get the results. 4. To speak candidly, the best way is bad, and you had better make your pictures by the gelatino-chloride process, described in the Year-Book for 1882.

G. Mackie.—It makes absolutely no difference which way you mix it.

Chas. W. Brown.—As far as we know, they are not in the market at present, and we have not yet seen the instrument. The data given are, however, sufficient for enabling an optician to construct one for you.

Alpha.—1. It is to be feared that without suitable apparatus or experience, your chance of success will be small, as it is difficult work when all the appliances are ready to hand. A rolling press of the full size is essential. 2 Long soaking is not required, and any method of quickly drawing it through the solution will answer. 3. It is better to dry it, as otherwise it may contract from partial drying during the time of exposure. There is no other reason for drying it. 4. You do not quite understand the method, as there is nothing to peel off, and the waxing mixture is applied afterwards.

C. Wyrall.—Send them to the Hon. Secretary, Mr. Greenwood Pim, Royal Hibernian Academy, Abbey Street, Dublin.

H. Rendell.—Cover it with thin tissue paper, this being far better than any composition applied to the glass. When the paper becomes yellow or dirty, you can easily renew it.

A. Brown.—1. See the Notes this week. 2. Not before fixing; but a second immersion in the fixing bath is required after the treatment.

Forster Brown.—A large round hole at the back, with a piece of blackened sheet metal mounted an inch from it, is all that is required.

E. B.—You have been surprisingly successful in your work, and your Swiss views are admirable. Still, it seems to us that by giving a longer exposure, and working with a less active developer, you might perhaps get a little more detail in the shadows. It is, however, extremely difficult to obtain all gradations of tint in the case of dark objects against a background of snow and ice. You must, however, bear in mind that we are doing our best to find a fault.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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CONTENTS.

COMPETITION OF PROCESSES FOR LANTERN SLIDES.

A COMPETITION of a kind which ought to lead to a useful result has been inaugurated by the London and Provincial Photographic Society. The competition, which has been instituted at the suggestion of Mr. W. E. Debenham, is between *processes* for producing lantern slides.

Photographers who are considered to be adepts at particular processes have been selected, and these have been asked to produce a certain number of slides—two or three, we forget which—from each of two different negatives. It has been made to be distinctly understood that the competition is not one between the individual photographers who have undertaken to represent particular processes, but is between these processes themselves, the object to be attained being a comparison of the merits of the processes. The negatives from which the slides are to be produced have been handed in turn to the gentlemen aforementioned, so that all the slides will represent the same pictures. The negatives are of excellent quality, and the slides are to be made by contact exposures, or are at least to be of the same size as the negatives.

A discussion on the subject of the competition took place a short time since, and waxed somewhat warm, several members apparently forgetting that the object of the competition is merely to compare *processes*, and is not in any way intended to be a trial of skill between the individuals who undertake the work. Nevertheless, several points of interest were touched upon.

Mr. A. L. Henderson had been asked to represent the wet process. He urged that the competition as instituted was such as would in no way bring out the special merits of that process as compared with others. Let the negatives, he said, be such as were faulty. Were either too thin or too dense, or had other such like defects, and he would undertake to show that the wet process would cope with the difficulties thereby introduced better than would any other; or let it be a case of enlarging or reducing, and he would guarantee a similar result. But with perfect negatives to be reproduced as transparencies of the same size, the wet process would show to no advantage. In fact, he urged that although the wet process was the best wherewith to undertake the general run of work, which included reproductions from all sorts and conditions of negatives, it would produce an effect not superior, and probably inferior, to others, with the conditions as Mr. Debenham had laid them down.

Mr. George Smith was asked to represent the Woodburytype process. This gentleman urged another objection to the method of the competition. He said that were it a case of producing a single slide from a negative, or producing even two or three, he *knew* that the Woodbury process would be beaten by others. Let it, however, be a case of producing a hundred or a thousand slides, and let clear high lights and *uniformity* be a condition, then he would guarantee a better result than could be got by any other process.

Probably Mr. A. Cowan, representing gelatino-chloride plates, might have added that if a condition was variety of tone, no process could touch that which he had undertaken to champion. The variety of beautiful tones which can be got from gelatino-chloride plates does indeed excel anything that we have seen produced by any other process. Those who have not tried the capabilities of these plates, or who have not had an opportunity of seeing what can be done by them, should inspect Mr. Cowan's exhibits at the present show of the Parent Society. There are frames containing an almost endless number of small transparencies, the colour of which ranges from a perfect black to something almost approaching crimson, and in every case the tone is a most pleasing one.

But to return to the Woodbury process. Mr. Smith stated that in producing lantern slides by means of it, it is always necessary to sacrifice somewhat of the gradations of density either at one end or at the other—that it is necessary, if we wish to retain all the detail of the highest lights, to sacrifice some of the detail in the deepest shadows. If we wish to retain all the detail of the deepest shadows, we must sacrifice some of the shadow detail. An attempt to secure the whole of the gradations from the highest lights to the deepest shadows always resulted, he said, in the production of either a flat or a heavy picture.

A theoretical reason might be given for this in the case of the Woodburytype—or still more in the case of the Stannotype—process.

It is stated by Abney, and the statement is pretty well recognised as correct, that there is no photographic process for producing a negative from a positive, or a positive from a negative, in which the correct gradation of tones—or, more strictly, densities—is retained; that in every case there is an exaggeration of the difference between one half tone and another half tone, and a diminution of the difference between various shadow tones or various high light tones, the result of continually producing a positive from a negative, a negative from this positive, a positive from this latter negative, and so on, being a tendency towards a picture in two tones only. Eventually, if the process be continued long enough, there will be nothing between transparency and a certain uniform amount of opacity, all half-tones having merged into one or the other extreme. A black and white image is got, in fact.

If any one wish to convince himself that this is the fact, let him take, for example, ordinary gelatino-bromide plates. One of these is exposed by contact under a nega-

tive. When the transparency is developed and dried, another plate is exposed under this, and the process is continued indefinitely. It will not be long—probably not a dozen plates will have been exposed in all—before we have a picture in black-and-white, with no half tone at all, and this, let the development and exposure be varied as we will.

In the fact that we have tried to explain, may lie the cause of what Mr. Smith states with regard to the Woodbury process.

In the Stannotype process, a transparency is produced from the original negative. From this transparency is taken a negative in bichromated gelatine. From this negative is produced the mould, from which finally the finished transparency is got. It is true that the last two processes are not, strictly speaking, photographic, and are not likely to—in fact, do not—produce that alteration in gradation of tone which we have spoken of; but even without them there is one more transition than there is in most processes used for producing slides.

In spite of the objections which were urged by Mr. Henderson and Mr. Smith against the competition of lantern slide processes, we will venture to say that useful results will rise from it, and will farther say that we hope that a suggestion which was made during the discussion may be given effect to. A member proposed that after the present competition was over, there should be another between the same processes, with this difference only—"that the negatives used should be typically bad ones, instead of typically good ones." A farther suggestion was made that after this second competition was over, a third might be inaugurated with the object of discovering which process would give the greatest uniformity when a number of slides were to be produced.

THE PALL MALL EXHIBITION.

Pictures and Apparatus.

third notice.

No. 27, "Winchelsea," by Mr. John Lswis, is an effective picture, and the same gentleman contributes "Bedford's Oak, Chingford" (No. 39), "A View in the New Forest, near Lyndhurst" (No. 106), and "Catford Bridge, Kent" (No. 446). Of these, the Chingford Oak perhaps possesses the most strikingly pictorial qualities, although when looked upon from a technical point of view, one cannot help thinking that the shades are somewhat too black. Mr. H. J. Godbold's "Religious Procession of Charles le Bon at Bruges" (No. 28) is a clever rendering of a difficult subject, and will recall pleasant memories to those who love to wander in the old, and now comparatively-deserted, Flemish cities. How the ordinary deserted aspect of Bruges contrasts with the stirring activity accompanying a public holiday! Indeed, it is only at the time of a Church festival or holiday that the tourist of to-day can feel himself face to face with a dim shadowing of the past history of the City of Bridges. Mr. Godbold also exhibits "Break, break, on thy cold grey stones, O sea!" (No. 40) a delightful study of beach and foam; "Wintry Garments" (No. 157), showing the trees in their mantle of frost and rime; "By the sad sea waves" (No. 158), a picture in which one can almost see the ripple moving onwards towards the shore; "Boulogne-sur-Mer" (No. 225); "To the Rescue" (No 226), an effective production, showing a ship in distress; "A Gale at Old Hastings" (No. 237), in which the fury of the raging sea is well depicted; "Rescued" (No. 260), a life-boat study; and 486, an enlargement from the "Gale at Old Hastings." All through Mr. Godbold's pictures there runs a vein of robust artistic feeling, and in several the pictorial qualities are very prominent. "Chorley Parish Church" (No. 29), by Luke Berry, is a picture taken from a well-selected point of view, and it at once suggests to the mind the idea of peace and quietness. Mr. Luke Berry contributes quite a host of other pictures. No. 128 is a view of Fountains Abbey; and here, again, the photographer has shown good judgment in selecting a point of view. Of Mr. Berry's remaining pictures, No. 170, "The Mid-day Meal," is, perhaps, one of the best. The reapers who are partaking have all the appearance of enjoying their dinner; still, we hardly know whether "The Swing" (No. 187) is not a more pleasing study. No. 197, "A Centenarian," represents the aged one sitting outside his cottage; No. 213, "An Autumn Morning," may be looked upon as a good failure, still a failure—the subject being an exceptionally difficult one; No. 294 is a frame of portraits; No. 349, "The Last Load," and No. 350, "In the Country," are good pictures of rural life, and there is the same rural air about 393, 394, and 395, "I'm ready," "Llanberis Pass," and "Daddy's Coming." 399, "Wild Flowers," is the last of Mr. Luke Berry's series, but is by no means the least as regards artistic merit.

"Studies" priuted in red carbon, by Mr. W. E. Debenham (No. 30), is placed rather too high to be seen with comfort; we have here two of the chubby-faced and curly-haired little ones which Mr. Debenham takes so much delight in photographing. We do not very much object to the term "red carbon" ourselves—although it is unscientific and inexact—because it conveys a pretty clear idea to the photographic mind. Still, it surprises us very much that Mr. Debenham should use such a phrase, considering how roundly he takes others to task for want of accuracy in expression. No. 31, "Venetian Boats," by Robinson and Thompson, is more than a photograph; it is a true picture of the lazy boats and sluggish water of the Adriatic Queen, and were it not in a photographic exhibition, one might take it for a study by Turner; we shall have more to say about this picture. Messrs. Robinson and Thompson also contribute Nos. 137, 138, and 161, the first and second of them representing the starting of the boats of the Mersey Sailing Club, while No. 161 is a frame containing eighteen half-plate pictures taken on board-ship.

Mr. T. W. Boord, M.P., has succeeded in producing a fine series of pictures from a yacht (No. 33), the sky and atmosphere being admirably rendered in most of them; these are just the photographs likely to be of real value to an artist. No. 34 is a frame containing some cabinet portraits by Mr. A. Ellis, and some good poses may be noticed. "Miss Villiers, as Fedora" (No. 35), by Adams and Scanlan, of Southampton, is a good picture, but the background is a trifle too dark for the drapery. One may be sure that any portrait taken by Mr. Valentine Blanchard will merit praise; and (No. 36) "Andrew Levy, Esq.," is no exception. Mr. Blanchard only contributes three other pictures to the Exhibition. No. 129, "A Siesta," shows a young lady who has gone to sleep over her book, while reclining in the open air. In No. 292, "A Message from the Sea," the prominent object is the name-board of the *Concord*, and this is the only relic of the good ship; but it strikes one that the edges of the wood and the lettering on the board have been remarkably preserved during all the buffeting about that it must have had. No. 302, Mr. Blanchard's remaining picture, shows "Miss Edith Powis," fan in hand.

Mr. T. M. Brownrigg is at home in the forest, and his studies of the "New Forest, near Lyndhurst—Old Oaks—Adam and Eve" (No. 37), are gems; while his remaining exhibit (No. 113), "Surrey Woodland Scenery—A Lane at Waverley—In a Wood at Cobham, and, On a Mill Stream at Waverly" show that he knows as well how to handle his camera outside the forest as when shaded by the boughs. No. 41 is a portrait of Sir Samuel Baker exhibited by the London Stereoscopic Company; while in No. 42 we have "The Dent d'Herens, from the Stockje Hut," one of those magnificent Alpine studies with

which Professor Donkin's name is now so thoroughly identified; others of the series being 63, "The Rothhorn from Lo Besso"; 92, "The Dent Blanche, from the Trift-joch"; 103, "The Weisshorn, from the Täsch Alp; 178, "The Matterhorn, from the Hörnli"; 337, a picturesque study of Swiss guides "At Work" and "At Rest"; 328, "The Weisshorn, and view from it"; 374, "Three Views near Zermatt," and 375, "Four Swiss Mountains." Mr. Donkin manages to do what is exceptionally difficult—that is, to secure all the beauty of the ice and snow, and yet do justice to the darker objects; and looking on his numerous pictures as a whole, one does not know where to look for anything comparable to the series.

In No. 44, "Studies of Cornfields, near Burgess Hill, Sussex," by S. Norman, one finds a trio of subjects; well exposed, so as to bring out the most shaded details, and yet showing no signs of the weakness or flatness which oftentimes is the result of "exposing for the deep shades." Mr. Norman has only one other exhibit, No. 94, a series of out-door studies which have all the merits of those just mentioned. "Summer Flowers," "Blackberrying," and "The After-dinner Pipe," are good titles that indicate the character of the photographs. The pictures showing the period of rest after the labour of faggot cutting are especially excellent.

Mr. A. H. Dyke Acland is particularly happy in his three studies of children (No. 45), the best of the three being "How long can you sit up, Jock?" in which the little one is severely testing the sitting-up qualities of the pet dog. Mr. Dyke Acland has other figure studies of merit (No. 95); (No. 337) "A Viva-voce Examination in the University of the Future"; and also a good study of sea and cloud (No. 492).

Mr. W. Davis, of Ripley, Derbyshire, has made pictures of the much-photographed Conway Castle, the threadbare Bridges at Bettws-y-Coed (Nos. 46, 47, 96), Bridge at Pemnacho (No. 257), Pandy Mill, Penma (No. 520), and the ever-recurring Fairy Glen at Bettws; but we do not see that he has exercised his camera upon any of the natural beauties within a couple of hours' walk of his own town.

The enlargement of a view of Constantine, Algeria, made by the Autotype Company from one of the negatives of the late Mr. Baden Pritchard (No. 48), is a striking picture, showing the town on its rocky elevation; a quaint mixture of old half-ruined buildings, intermingled with modern houses in the French style, and native huts. Another picture from the series taken by Mr. Pritchard during his recent trip is a scene in the Sahara, near Biskra, "At rest in the Desert, outside the Biskra Oasis" (No. 79). It represents an Arab encampment, and was taken in the early morning; it conveys in a singularly forcible manner the idea of rest, the wandering life of the Arab tribes serving as a foil against which the contrast becomes especially striking.

Somehow or other the yacht "Fleur de Lis," of Mr. T. Milman Brown, does not seem to convey the idea of motion, it seems to be dead and stiff; but his cattle piece, "Repose" (No. 81), makes a fine study, and his "Home Cottage" (No. 126) deserves praise. No. 204, "Church Lane, Shanklin," by the same gentleman, is somewhat marred by the exaggerated whiteness of the road; while No. 371, "An Isle-of-Wight Cottage," and No. 519, "Summer Evening," are creditable productions.

Lieut. C. E. Gladstone's "Botanical Gardens at Palermo" (No. 50) pleases us much, and one cannot fail to be struck by the almost tropical character of the vegetation—palms and aloes being most noticeable. Lieut. Gladstone has two more exhibits: No. 80, "In Moor Park," is a good picture, and also No. 439, another view in Moor Park, "Cedar Tree;" these latter being printed in platinotype.

We have already referred to Messrs. West and Son's medal exhibit, and reproduced one of the most striking of the yacht pictures, a group at comparative rest; but as a contrast to this picture, we now reproduce the central photograph of their frame — the yacht "Buttercup," scudding along like a bird under the influence of a stiff wind. Of its kind, this picture is almost unique.

Another of the medal pictures is also presented to our readers as a print from a Meisenbach block: one of Mr. Auty's remarkable photographs of lightning; and in writing about this picture he says:—

"I took on the evening of Saturday, August 9th, during a very heavy thunderstorm, when the storm was at its height; the pictures were taken from the top room of a house, with the camera pointing seaward. The focussing was done on the lightning, as the flashes followed each other so quickly. I made six exposures on rapid plates, but four out of the six plates appeared to be fogged through sheet lightning which accompanied the forked variety."

The most notable point with respect to Mr. Auty's lightning photograph is, that the discharge appears to be of the "brush" character at the extremities of the spark, and only fairly disruptive in the central portions. This may be due to the circumstance of the photographs being taken seawards, and the flashes rather striking between vaporous masses than upon a solid substance. If our readers will look at the lightning photograph of Haensel, given on page 2 of our present volume, they will be able

to detect a definite striking point where the discharge enters the ground.

Mr. Tagliaferro's picture of the Cathedral at Malta; the supplement which we present to our readers this week is, like that issued with the NEWS last week, the work of a non-professional photographer; and Mr. Tagliaferro has to be congratulated on being the only exhibitor this year who has been honoured by a double award. It is true that the Autotype Company will take the joint medal which has been given for the two enlargements—that of the picture which forms our supplement this week, and that from Mr. Sinclair's negative of Derwentwater—but Mr. Tagliaferro takes the medal awarded for the original photograph from which our supplement has been reproduced.

Few photographers make a special point of producing church and cathedral interiors, and, when done, it seldom happens that they have all the perfections which those who have not attempted this difficult class of work consider they have a right to look for in the work of others. To say that Mr. Tagliaferro's picture is without faults would be absurd; but despite of them, it is such a magnificent picture of an exceptionally difficult subject, that one can only endorse the opinions of the judges in their verdict, that it is essentially the "interior" of the 1884 Exhibition. Although there are three other photographs of the interior of the Church of St. John in the frame containing the picture which we present to our readers, it is pretty generally recognised that the medal was awarded for that which we publish this week, this being undoubtedly the finest picture of the series. In our first notice of the Exhibition we have already noticed the main points of the pictures, so we need say no more at present.

Practical Papers for Beginners.

No. 12.—INTENSIFICATION OF NEGATIVES.

IT often happens that a negative is too thin to yield a good print, even though all the details of the original subject be reproduced; and this want of vigour is very frequently a consequence of over-exposure in the camera.

The strengthening or reinforcing of the negative, so as to convert a thin plate into a vigorous picture, is known as intensification, and one must confess that there is no perfectly and uniformly satisfactory means of intensification known; but we will now describe that which we consider the best in ordinary cases.

The well-washed but unvarnished negative is immersed in the following solution:—

Mercuric chloride	1 ounce
Sal. ammoniic	1 ,,
Water	40 ounces

In this solution the image will gradually become white, and when the bleaching action is complete—no dark portions being visible when the negative is looked at on the glass side—the plate may be removed from the mercuric bath. The next step is to very thoroughly wash the plate, and this can only be effected by long soaking in several changes of water. The following may be taken as giving an idea of the amount of washing which will be sufficient. First rinse the loosely adhering solution from the plate by allowing water from the tap to flow over it for a few minutes; after which place it in water, an inclined position being preferable. If this water is changed every half hour during three or four hours, and one takes care to slightly agitate the water now and then during the periods of soaking, one may consider that the whole of the soluble mercuric salt is removed. Next place the whitened negative in a weak ammouiacal bath made as follows:—

Liquor ammonia	½ ounce
Water	20 ounces

In this liquid the image becomes rapidly darkened, and, generally speaking, the maximum darkening is attained in about five minutes, when all that is necessary is to wash the plate, and to allow it to dry.

The method just described is thoroughly satisfactory when only a moderate degree of intensification is required; and if the washing is thorough after the treatment with the mercurial solution, there seems to be but little or no probability of the negative subsequently fading; but, should the washing have been insufficient, not only do the transparent parts of the negative become veiled, but the negative is likely to become light in colour, and again weak, in the course of a few months. It is, however, curious to note that a negative of this kind which has faded may generally be restored by repeating the process of intensification. It is scarcely necessary to remark that it is useless to attempt the intensification or restoration of a negative while it is coated with a film of varnish, but the varnish may be readily removed by the following method.

Warm a stout porcelain dish by filling it with hot water, and having dried it by wiping with a towel, put the plate in (film upwards), and pour on enough methylated spirit to cover it.* Now rock the dish to and fro for four or five minutes, pour off the spirit as completely as possible, add more, and again rock for a minute or so; a couple more rinsings with spirit will now suffice to remove the resinous material; but the negative should be soaked in water for a few minutes before immersion in the mercuric bath.

When a very considerable degree of intensification is required, it is better to treat the whitened negative in another way. After it has been removed from the mercuric bath, and thoroughly washed as already directed, it is immersed in a dilute solution of sulphide of ammonium—one part of the strong solution, and about ten of water; in this liquid it becomes almost jet black.

In any case it is well to take the precaution of making a transparency from a valuable negative before intensifying it, as in case of any unforeseen circumstance causing the destruction of the picture, the negative can be reproduced from the transparency by any method which is adapted for making a transparency from a negative. Details as to the method of making transparencies will be found in our recent "Practical Paper" on making lantern slides (page 645).

* See foot-note, regarding methylated spirit, on p. 596.

HINTS ON POSING AND THE MANAGEMENT OF THE SITTER.

BY H. P. ROBINSON.

Chapter III.—The Three-Quarter Length.—Men.

In the kind of picture we have now under consideration, there is more scope for variety of pose than in those which include the head and shoulders only. Almost every variety of picturesque effect can be brought to bear, both of light and shade and line.

The three-quarter length is generally supposed to include the figure down to the knees, but in treating of it we may fairly include a proportion that takes in somewhat less, and is more nearly a half-length.

For ordinary every-day portraiture of ordinary humanity, no great variety of pose is necessary—or, indeed, admissible. This is especially so as regards the photographic presentation of men. If you will go through a modern exhibition—for example, the Royal Academy—and take a general and comparative survey of all those pictures which used to be catalogued under the title of "portrait of a gentleman," you will find that the variety in the pose is very limited. This is due in a great measure to the restraint that modern dress imposes on the artist. The masculine coat and trousers of to-day do not admit of artistic arrangement, and any attempt to alter them savours of affectation. Adam-Salomon's black velvet cloak was very picturesque as arranged by his artistic hands, but it looked out of place on a Manchester merchant or a book-maker. Some of our best portrait-painters seem to have given up all hope of varying the positions of their sitters, and seat them all, with rare exceptions, in the same chair in endless succession. I do not state this for the photographer's imitation, he had better always strive for improvement, and not give up all effort as the painters seem to do when they are elected into the Academic body, but as some little comfort for him when his efforts to become original fail.

Photography has done much to teach the painter. There can be no doubt that our art has greatly improved portrait painting. When photographers began to take portraits, portraiture in paint was at its lowest ebb; it is now at its greatest since the time of Gainsborough and Reynolds. Our art has been especially useful in teaching the painter what to avoid; it has completely abolished the column and curtain. I don't think this once inevitable background has been seen in the Academy Exhibitions for several years. It has taught him how to give individuality and character. In every portrait painter's work before the introduction of photography, one face was very like another, and it has taught him that conventionality is only to be tolerated in decorative work.

But if there is very little variety open to the operator in his portraits of men, there is one posture that I should like to see entirely discarded, and never used any more. This

pose is hallowed by tradition, and sanctified by use, for it has been the one pose of photographers since the morning twilight of the art. It is the pose with which the amateur begins; with which the professional, however capable of art knowledge, commences; and with which the incapable spends all his days. I give it here as an example of what to avoid.

Who does not know, who has not been guilty of, this pose, in which the victim appears to be laid out and trussed, little round table and all? But it is all very well, the young photographer will say, to tell me what to avoid—destructive criticism is always easy; but I want to be told what to do. I can only reply by again resorting partly to pointing out what to avoid.

Let us take a portrait. The subject is a gentleman of any age between twenty-five and fifty; he wants a standing portrait. To begin, make him stand in as easy an attitude as possible; don't dictate to him how he shall stand at first, but let him take his own position, and use his suggestion if good; alter it a little if necessary, but don't "mess the figure about." If it does not easily "come," make him walk away and try again. It is possible he may have an idea that he ought to be upright when he stands for a picture, and will stand equally on both legs. Now, however strange it may seem, human beings seldom stand on both legs at once, except in their first and second childhood. Infants and very old men *toddle* equally on both feet. Between these ages a person, when standing at ease, rests on one leg, and in walking it is one or other leg alternately that bears the burden. By this means nature gives variety of line, and avoids the uniformity it abhors. In posing a man, strive to get sufficient variety to give picturesqueness. Do not let the head be in exact line with the body: if the figure is turned full, let the face be in three-quarter view; if the figure is slightly turned away, the face may be full or in profile. See that there is variety in the figure; do not let the hands appear as two spots exactly opposite each other on both sides; do not allow uniformity in the furniture and accessories; for instance, if there is a chair on one side of him, it would be better not to have another on the other side. I do not like to speak too definitely, for fear of cramping the operator instead of helping him; and I can quite conceive cases where exactly the reverse of what I have recommended would be exactly what was wanted. If possible, avoid the leaning position—the pedestal and back-of-chair business has been thoroughly overdone. So much are some sitters, who often have their portraits taken, used to it, that they naturally ask for something to lean on.

"It makes me feel so easy and natural," a man will say; but is puzzled when asked if he can ever remember leaning on a pedestal, and looking like the monument of Shakespeare, anywhere but in a photographer's studio. I remember a studio, in the days of the carte-de-visite mania, where the pedestal and head-rest were fixed institutions, and every figure was fitted to them, all with their legs crossed, like Crusaders on their tombs, only upright.

To a seated figure the same suggestion for variety will apply. A man will sometimes think he looks easy when he feels so, and will slouch down in a chair, put his hands in his pockets, shrug up his shoulders, and, putting his foot up over the knee of the other leg, will present the sole of his boot as the principal object in the picture. But it is "not thy sole, but thy soul," as Gratiano says to the Jew, that is wanted in a portrait, and the lounger must be shaken up. Some young men think it looks easy and graceful to sit astride on a chair, and lean their elbows on the back. To me they look awkward and ungraceful in this position, and all I can say about it is that it is just allowable when it cannot be avoided.

Old men usually make admirable photographs. There is a gravity about old age that seems to suit photography. White hair may be a technical difficulty, but it is to be got over by judicious lighting and manipulation, and difficulty ought to lend a zest to all arts. Old people are usually steady without much effort, and, as a rule, they do not care so much how they look as younger people do,

and therefore are free from the self-conscious look that so sadly mars nearly all portraits, whether painted or photographed. Seated positions, in arm-chairs for preference, seem to be most suitable for age.

PHOTOGRAPHIC PROGRESS OF THE CURRENT YEAR.

BY W. LANG.*

I do not think that this year, so far as it has gone, can be said to have produced any great photographic discovery. It is more a working up of details that has been going on. Perhaps the most important fact to notice first is Dr. Vogel's method of reproducing colours in their true colour intensity. We all know how, in photographing a blue object, the print from the resulting negative brings that colour out as if it were white in the original, while yellow and red come out more or less dark. A photograph of an oil painting, for instance, does not represent the colours in what may be called their relative tone as seen by the human eye. The addition of a dye to a sensitised film, to diminish the action of the blue and violet rays, and increase that of the red yellow, is by no means a new one. Dr. Vogel himself was working in this direction as far back as 1873. It was only this spring, however, that details that would enable any one to work out the process for himself were published by Dr. Vogel. The first communication from Vogel on the subject is to be found in the number of the Photographic News of 28th March. There are further articles by him appearing in the numbers of 2nd, 9th, and 11th May. The dye used by Vogel for collodion plates is eosin, and for gelatine plates, azaline. Through the kindness of Mr. Bolas I am enabled to show specimens of the work done by these plates, and the fact that they have been prepared by Dr. Vogel himself lends an additional interest. The rather formidable term isochromatic has been applied to plates treated with the fore-mentioned or similar dyes, and already they are an article of commerce.

Passing from the work done by a continental investigator, it would have seemed an anomaly had we had nothing put forward by Capt. Abney. A short article entitled "Molecular Physics and Photographic Action," and appearing in the News of May 16, is well worthy of perusal. He proves from experimental evidence that heat causes greater sensitiveness in a gelatine plate, while cold diminishes it.

A series of six lectures on "Photography considered as the work of Radiation," were delivered at the Royal Institution last spring by Capt. Abney. Another very interesting series of lectures were delivered early in the year, under the auspices of the Society of Arts, by Mr. Bolas, the subject treated being "Recent Improvements in Photo-Mechanical Printing Methods."

It may interest members to know that a very successful method of photo-engraving is being carried on in Glasgow at the present moment. The process is one devised by an Austrian, Herr Klic, who spent several years in perfecting it. The portrait of Mungo Ponton, which appeared in the Year-Book of Photography for 1882, was produced by Klic's method. Messrs. Annan have acquired the right to work the process in this country. It is at present a secret one. Under an arrangement with Messrs. Annan, Messrs. Maclure and Macdonald are now producing work done by Herr Klic's method.

Passing from photo-engraving, let us consider for a few minutes what has been exercising a good number of minds this last few years, viz., the production of printing photo-blocks to be used in letter-press printing. I think the day is not very far off now when our illustrated magazines will avail themselves of some of the processes that have been lately brought forward. The conversion of the gradation of an ordinary photograph into a black and white grain or stipple with the lights and shades of the same intensity as the original, is perhaps more a mechanical problem than a photographic one. I would especially call your attention to two processes that have been quite recently introduced, viz. Meisenbach's of Munich, and Ives' of Philadelphia. Judging from the results obtained, it seems to me that the days of the wood engraver are considerably on the wane if they be not about numbered. The starting point of Ives' method, in his original method, is a Woodbury relief; this is covered with ink, and a peculiarly prepared paper is pressed against it. The higher portions of the relief crush down the grain of the paper forming the blacks of the picture, while the gradations, the half tones of the relief, are rendered by this crushing being not so complete. The print thus obtained can either be photographed or used as a transfer. Ives' latest improvement is to take a plater-cast from the relief picture, and by means of an elastic stamp impresses an inked stipple on its surface. Where the relief is highest and the pressure greatest, there the ink spots unite and form the blacks, while in the deeper portions of the cast the spots are exceedingly minute. The merit of the invention lies in the application of the elastic stamp. I have no details as to how the photo-blocks by Meisenbach's process are produced. Woodbury, Zuccato, and others have brought forward processes for producing phototype blocks, but Ives' and Meisenbach's are perhaps the most recent.

Passing on from the consideration of these photo-mechanical methods, let us discuss for a little what has been said and done regarding developers during the period we are considering—a subject that cannot fail to be of interest to us amateurs. Every one has a certain pet formula, and from the enormous number of formulæ published from time to time, it would be no invidious task were the amateur to tackle each one in succession. Hence, perhaps, the wisest plan, after all, is once having a formula giving good results, to stick to it. There is no doubt, however, but that the soda developer has been coming to the front. The soda developer pure and simple—or, to give it its characteristic name, the washing soda developer—is by no means the best form of this developer. The negatives produced have a green unhealthy hue, which would prejudice many against its use, accustomed, as most of us are, to the blacks of the ammonia pyro developer. The prints are, however, all that can be desired.

The formula to be recommended is that of Mr. Bassano—

Pyro	4 grains
Sod. sulphite	30 ,,
Water	1 ounce
Anhydrous sodium carbonate ...	... 40 grains
Water	1 ounce

For every ounce of pyro solution 1 dr. of soda solution to be added—best in my experience in two portions. The negatives have very much the appearance of the old collodion plate. I developed a good number of negatives this summer with the developer in question, and with the exception of some plates lost through frilling during the very hot weather, I had no reason to be dissatisfied with it. I question if at the time the plates I refer to were developed, they would have stood the ordinary ammonia developer. Solutions in the room showed a temperature of 70° F., and the water from the tap a constant temperature of 60° F. The doing away of the odour of ammonia in the developing room is certainly an improvement, while a solution of sodium carbonate is much more reliable as to its original strength being retained than a solution of the very volatile alkali ammonia. One thing members should bear in mind, when using sodium sulphite, is, that it is by no means a stable salt in solution. Fresh solutions are indispensable in order to obtain the best results. It is clear that formulæ in which sodium sulphite is employed should have neither citric acid nor a bromide present. Bassano's formula meets this requirement.

Regarding the potash developer, where potassium carbonate replaces sodium carbonate, I am informed that frilling can scarcely be prevented; this is hardly to be wondered at, seeing potassium carbonate is much more strongly alkaline in its character than the corresponding sodium salt. A mixture of the carbonates has been also recommended to be used. I fail to see when a combination of these two alkalies should have anything special in itself for it to be recommended. A hint thrown out by a contributor to the Photographic News, regarding the employment of nitrites instead of sulphites in the developer, is a suggestive one.

Hydrokinone, as a developer, will never, I think, be adopted by professionals to any large extent, its action being slow as compared with the universally used pyro. This fault—if fault it be—is one that does not affect the amateur in the same manner as the professional. Inasmuch as hydrokinone does its work without requiring the presence of a restraining bromide, it is *par excellence* the developer. Mr. Goodwin, who develops largely with hydrokinone, informs me that for some time he was troubled with thin images. This he overcame by giving a second application of fresh hydrokinone when the details were out.

With the exception of enlargement work, ferrous oxalate does not seem to be much employed either by professionals or amateurs in this country. It is, however, largely employed on the Continent, where the conditions of light are much more uniform

* Read before the Glasgow and W. of Scotland Photographic Association.

than with us. The ferrous oxalate does not allow the same latitude of exposure. The inky black tones of the image developed by ferrous oxalate are all that can be desired.

A word or two regarding our old friend "hypo." While developers increase and multiply, it remains the photographer's universal fixing agent. One thing is certain: it will be difficult to find a substance that would act better than hypo, and at such a low rate of cost. The hyposulphite of the photographer, however, is not the hyposulphite of the chemist, and already in several treatises on photography we find its true chemical name given to it, viz., sodium thiosulphate. It is therefore not at all improbable that, instead of the familiar hypo, we shall have to accustom ourselves to the use of the term "thio," that being, I take it, the natural abbreviation of thiosulphate.

We will pass on now to consider briefly two other subjects that are of interest to us in the production of good negatives, that of intensification and reduction. I know that as far as intensifying is concerned, many of us would prefer to take a fresh negative, to commencing to try to make good a negative that has not come up to a good printing density. This, however, is not always practicable. Mercurial intensification is the one most commonly used for gelatine plates, but the proneness to staining of the film has been one of its great drawbacks, prolonged washing between the application of the mercurial salt and that of the ammonia being required to prevent this. The washing after intensification must also be very thorough to ensure permanency. The method of employing a solution of sodium sulphite to the bleached image, instead of ammonia intensifying, I have tried on several negatives, and can testify to its excellent character. There are no insoluble products formed in the film, hence the washing, to eliminate the mercuric chloride that may happen to remain in it, does not require to be of the usual thorough character. The plate for that part may be taken out of the mercurial chloride solution, and plunged directly into the sodium sulphite solution without staining the film. I should mention, that a very convenient strength for the solution of the sulphite is a 10 per cent. one.

It may seem superfluous to state the fact, but for the benefit of our less experienced members it may be as well to do so, that the complete removal of the hypo is necessary before commencing this or any other method of intensification, otherwise sulphides are formed within the film, and the picture hopelessly stained.

Coming now to the counterpart of intensification, that of reduction. The method for reducing an over-dense negative that has found most favour is one devised by Mr. Howard Farmer, and published by him in the Year-Book of the present year.

TRANSPARENCIES.

BY J. PIKE.*

The subject of transparency making is a very large one, and to treat it thoroughly—that is, by a description of all the various known processes—would take up, not one evening, but three or four. However, I think we may limit ourselves to two or three processes, and consider—1st, the carbon method; 2nd, the collodion, wet and dry; and 3rd, the gelatino-chloride.

Those who have negatives small enough will find the carbon process by no means difficult. Briefly, a special transparency tissue is sensitized with bichromate of potash in the usual way; it is then squeegeed upon a piece of very clean collodionized glass. When dry (which process must take place in the dark) it is peeled off, cut into the proper sizes, and exposed under the negative. The usual circular, dome-shaped, cushion, or square masks, serve very well for the "safe edge" always used in carbon printing. The exposure is rather longer than that given for prints. The exposed tissue is then immersed in water until it softens, squeegeed on to a piece of very clear and clean glass, and developed as for prints. Plenty of time should be taken over this operation, and the water used should not be too hot. Carbon transparencies may be intensified by pouring over the still wet film a solution of pyrogallic acid, followed, after slight washing, by a solution of sulphate of iron.

Wet collodion I have not tried, but I am told that, provided the "bath" be in good condition and ordinary care used, there is nothing to prevent anyone from achieving success in this direction. A "bath" may be purchased ready made and in the best condition. The collodion rather old and high coloured is preferred, as it works cleaner. Mr. Hedley Robinson, whose paper on "Transparencies" will be remembered by most of us, recommends that the "bath" be decidedly acid, and suggests as a developer a solution containing—

Ammonio-sulphate of iron	15 grains
Glacial acetic acid	½ drachm
Lump sugar	15 grains
Water	1 ounce

The older the solution the better. Mr. Robinson also recommends as a toning solution—

Ferridcyanide of potassium	2 grains
Nitrate of uranium	2 ,,
Chloride of gold	$\frac{1}{15}$th grain
Water	1 ounce

which, he says, gives a colour nearly approaching that of a Woodbury slide.

Dry collodion plates will probably be used by some of us. In this case, doubtless, the Beechy emulsion plates will be generally preferred. Their advantages have been summed up by Mr. Robinson as follows:—"Considerable latitude of exposure, good colour of image, perfect control of density, and comfort in developing. They bear forcing with ammonia, and are not easily fogged." The emulsion can be bought ready made, all that is then necessary being to coat properly-cleaned and prepared glass plates.

Good results have been obtained on gelatino-bromide plates. I have one or two samples of work on ordinary gelatine plates, but there is great risk of veil and fog. The ferrous oxalate developer gives about the best results, and the proportion of potash solution to that of iron sulphate should be increased slightly, using bromide.

We are now able to get gelatino-chloride plates, and with these we can do all that we require without much difficulty. They are rather slow. If printing by contact, five minutes, twelve inches distant from an ordinary fishtail gas jet, is not more than enough for a negative of ordinary density. I will show later on a few negatives of varying density, and exhibit transparencies taken from these on gelatino-chloride plates. This will give some idea of the exposure requisite. The developer I succeed best with is one containing carbonate of ammonia, citric acid, and a solution of sulphate of iron. This is Cowan's second formula. The plate should be fully exposed, and the development must not be prolonged. A variety of tones are produced by varying the developers, three of which are given.

I find them very slow when taking transparencies through the camera in daylight, ten minutes being the shortest exposure with a rather thin negative. This was, however, in very dull weather. The lens used was a six-inch Ross's symmetrical, full aperture, the transparency being made from a whole-plate negative. Care must be taken in mixing the developer. The iron solution should always be added to the potash or ammonia solution. I use as a clearing solution a mixture containing one ounce of alum and one ounce of citric acid to one pint of water. The developer may be used for several plates, and the same amount of density may be had with the last plate as the first.

* A communication to the Newcastle-on-Tyne and Northern Counties' Photographic Association.

Notes.

The Year-Book of Photography, which has been the standard book of reference for more than a quarter of a century, will be published on the usual date, December 20th next; and this will enable our readers to have it in their hands before Christmas Day.

Those who have promised contributions will, we hope, send them to us promptly; and we shall be happy to receive short and practical articles from such of our friends as may be able to communicate interesting matter.

It is by no means uncommon to regard the rapidity of a lens simply as a function of aperture with focus, and to neglect the actinic transparency of the glass; but some recent

investigations of M. Chardonnet show that one cannot afford to overlook variations in the quality of glass, except in the case of very rough determinations. English optical glass is generally, according to M. Chardonnet, rather more transparent to the actinic rays than French glass.

The "Triplet" portrait, introduced by Mr. Anckorn, of Arbroath, consist of three separate portraits of the same person, vignetted into one another, the whole being carte size. M. Anckorn's idea of thus giving three positions on one carte is an excellent one.

"The Editor would feel obliged with copies of beautiful photos. for editorial purposes"; after this follows a list comprising the whole of the pictures contributed to the Exhibition by the person to whom the missive was sent. The above is a note which has been posted to several—and probably to many—of the Pall Mall exhibitors; and the letter appears to be dated from the office of a weekly newspaper; still we do not find that the paper in question is mentioned in "May's Press Guide," or "Mitchel's Directory" for the present year.

Light emitted by insects of the Pyrophore genus shows no bands when examined spectroscopically, according to MM. Aubert and Dubois, the spectrum being continuous; but when the light is very weak it only contains green and orange. We have already referred to the photographic action of the glow-worm's light.

If the Lord Mayor's show of this year is to be the last, Alderman Nottage is determined it shall not be behind its predecessors in magnificence. Rumour has it that the worthy Alderman interviewed Mr. Augustus Harris on the question of the cost of producing the procession of kings and queens which made such a sensation in the Drury Lane pantomime of 1883. Said Mr. Harris, doubtfully, "It will cost you a lot of money. The bill for boots alone will stand you in some £200." Mr. Nottage has decided to abandon the idea.

Punch is poking its fun at the Lord Mayor elect, and, at the same time, reviving a very crusted old photographic joke, when it proposes that the Mansion House Police cases shall be heard before his Lordship *in camerâ*. It was *apropos* to the same municipal dignitary, by the way, that Mrs. MeMalaprop has made her latest "derangement of epitaphs." She wants to know if his Lordship ever had his stereoscope cast to see if he was born under a civic star.

Some years ago it was a common thing for the disappointed exhibitor to air his spite against the judges by writing long and furious letters to the NEWS, and pointing out the utter and complete unfitness of the adjudicators for their office; but such exhibitions of littleness are now comparatively rare—as a matter of fact, these outbursts of spleen are too transparent. As a contrast, we may quote the following remarks from one who would have certainly taken the medal for land and riverscape had one been awarded.

"The judges at the exhibition seem to have done their difficult work better than usual, the only fault I can find being that W. Cotesworth did not get a medal for his 'Awkward' print, and the ladies whom he has represented did not have one each also."

One of the curiosities of the Pall Mall Exhibition will probably pass unnoticed, save by the sharpest and most experienced professional eye. It is a portrait, the head of which is from one negative, while the body and accessories are from another. Probably, as often happens, the most successful expression has been associated with some defect in another part of the picture, and the photographer resorted to the expedient of joining the best head to the best pose. The combination has been most cleverly effected—so clever that it would be a pity to name the picture. The curious visitor must find it out for himself.

The friends of the Claimant lay much stress on the importance of an instrument called the identiscope. The identiscope is a variation of the camera-lucida. Two portraits are placed on a couple of hinged panels, with a sheet of coloured glass between them. The panels are opened out like book covers till the images are reflected in the coloured glass, and become coincident. The inventor fixes upon the mathematical centre of the pupil of the eye as the starting point, and claims that when a line drawn through these centres in each portrait coincide, the two portraits are of one man. The portrait of the Claimant, he holds, thus coincides with the well-known portrait of young Roger Tichborne.

There are also other points of coincidence which may be summed up in a question of the inventor—"Can it be for a moment imagined," he asks, "that in the photographs of any two distinct men, there shall occur a perfect correspondence—first, in the diameter of the iris; second, in the plan and space occupied by the eye-brows; third, in the precise width from one pupil of the eye to the other; fourth, in the curve and opening of the eyelid; fifth, in the shape and the profile line of the nose; sixth, in its exact length; seventh, in the precise points at which the nostrils arise from the face; eighth, in the depth of the upper lip; ninth, in the place and size of the mouth; tenth, in the curvatures of the lower lip and chin; eleventh, in the precise place of the dimple mark of the chin." There is only one man who can answer this question, and he is Mr. Francis Galton. The problem is one which his experiments in composite portraiture should solve.

One of the chief expenses incurred in legal and criminal work is the result of the many copyings of depositions, of witnesses, of indictments, of briefs, of deeds, and documents of all kinds which are now laboriously made by copyists and law writers at so much a folio. It has been suggested—though we need scarcely add, the suggestion has not been favourably received in legal circles—that copies should be multiplied by one of the many processes with which photography is now allied, perfect accuracy and considerable economy being thereby secured.

Solicitors will, of course, oppose this, tooth and nail; but the Treasury, which repays to counties the large proportion of the expenses of criminal prosecutions, might surely initiate the reform by insisting that the copies for which the country pays should be effected in the proposed manner. "Process by law" is already a well-known legal term, and we do not see why in future we should not have as much of our law as possible done by "process."

Professor J. Miller Thompson will read before the Society of Chemical Industry, at Burlington House, a paper on "Photography for those Engaged in Industrial Purposes," the date fixed being December 1st.

The sensitive plate now records almost every natural phenomena which is visible within the range of civilisation, and among the records of the recent eclipse which have been obtained, one may mention the fine series of photographs obtained by MM. Paul and Henry at the Paris Observatory.

The old saying that "treaties are like pie-crust, made to be broken," must be altered if the custom the Chinese have introduced of interpolating initials, &c., on such documents, and then photographing the amended copy, is followed. It will be more *apropos* to say that "treaties are like negatives, to be touched up."

A common complaint against photographic portraits is, that they so rarely represent people as their friends know them. Judging from the "Answers to Correspondents" by a physiognomist in a journal which caters especially for ladies, this complaint must be ill founded. Out of a whole host of answers, we will take a few at random: "The eyes in this photograph being so close together denote astuteness which amounts to cunning;" "The curved and somewhat thin lips combined with the rather long upper lip denote eloquence;" "The eyes in this photograph show vivacity and coquetry, the eyebrows and straight long eyelashes an imaginative and poetic temperament;" "The photograph shows great sweetness and tenderness of nature, but both brows and eyebrows are wanting in force of character;" "Indicates a person of decidedly nervous temperament—the eyes are clear both as to shape and power of colour;" and so on *ad infinitum*. And yet scores of persons, especially ladies, declare that photography does not do them justice.

Patent Intelligence.

Applications for Letters Patent.

13,596. Alfred Julius Boult, 323, High Holborn, Middlesex, for "Gelatine plates, films, or tissues for use in photography, and process of manufacturing and using the same."—Communicated by George Eastman and William Hall Walker, United States.—Dated 14th October, 1884.

13,774. John Mitchell Dowling Worsnop, 4, South Street, Finsbury, London, for "An improved method of transferring the film of photographs, or a film of colour painted upon photographs, to canvas or other surfaces."—(*Complete Specification.*)—Dated 17th October, 1884.

Patents on which the Fourth Year's Renewal Fee of £10 has been Paid.

4394. Ernest de Pass, of the Office for British and Foreign Patents, 68, Fleet Street, in the city of London, Patent Agent, for an invention of "Improved processes of obtaining bas-reliefs, medals, casts, dies, matrices, and the like by photography, and means or apparatus to be employed in such processes."—A communication to him from abroad by William Henry Guilleband, of 17, Boulevard Saint-Martin, Paris, France.—Dated 10th October, 1881.

Specification Published during the Week.

11,556. Eugen Himly, late captain, No. 54, Zossener Street, City of Berlin, Kingdom of Prussia, Empire of Germany, for "Improved method of, and apparatus for, taking photographs by artificial light."—(*Complete Specification.*)—Dated August 22, 1884.

For obtaining the irregular reflection of rays from powerful sources of light, so as to produce an artificially diffused light analogous to that of daylight, it has hitherto been customary to employ, as the most perfect means attainable, intensely illuminated white surfaces, either plane or concave, not acting as mirrors, which reflect the rays divergently in the general direction of the object to be illuminated. These illuminated surfaces can also consist in dulled sheets of glass, through which the rays from a number of sources of light are caused to pass divergently. The diffusion thus obtained is, however, but little analogous to that of daylight, as the direction of the rays still remains more or less one-sided, and, consequently, the photographic pictures obtained by these means have easily discernible strongly one-sided illumination.

Another usual method of a comparatively perfect nature for obtaining an illumination analogous to that of daylight, consists in the use of several sources of light shaded by opal globes arranged round the object to be photographed, which, together with the photographic apparatus, is mounted on a revolving turn-table.

Independently of the question of the expensive nature of this arrangement, requiring specially careful attention to the several sources of light, it is not free from imperfections of illumination, due to the fact that in addition to the rays that are irregularly reflected in the desired manner by the small surfaces produced by the clouding of a glass globe, many rays pass through the glass which, in consequence of the varying absorbing or refracting powers of the glass, and also in consequence of the want of parallelism of the glass surfaces, produce light and dark spots on the object.

My present invention relates to a method of, and appliances for, producing artificial illumination as analogous as possible to the action of day-light, consisting mainly in the employment of a mechanically-moved illuminating screen which reflects the rays from one or more powerful sources of light irregularly in the direction of the object to be photographed, but which entirely diverts the direct or regularly reflected rays of such sources of light from such object, the movement of the said screen being effected during the whole time of exposure either through a certain arc round the stationary object to be photographed, or through a straight line past the same. By this method I obtain firstly, by means of the construction of the illuminating screen, an illuminating effect analogous to the action of diffused daylight, and free from shadows or excessively strong shadows; and secondly, owing to the quicker or slower advancing motion of the screen, regulated according to requirements, I obtain a moderate lateral gradation of the illumination of the object, similar to that of daylight. In particular, I am enabled by this method to prevent the too powerful illumination of one side of the object while another side has to be exposed for a longer time in order to develop deeper shadows.

The number of sources of light employed in combination with my illuminating screen is not limited; there may be only one, or two, or more arranged in an analogous manner. The adjustment of the bottom surface on a horizontal axis has for its object to distribute the light to a greater or less degree to the lower parts of the object to be illuminated.

Of the constructions that can be employed for effecting the motion of the illuminating screen during the duration of the exposal, two are more particularly suitable.

The object to be illuminated is situated near to and underneath the centre of motion of the crane, so that the illuminating screen is caused to move in a circular path round the object by means of any suitable mechanism. Or a semicircular rail is

suspended from the ceiling of the studio, on which rail the screen is made to run by means of rollers, being moved to and fro by cords.

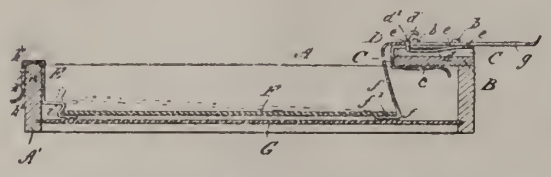
Patents Granted in America.

306,281. Samuel B. Pratt, Boston, Mass., assignor to Charles Parker, Newark, N. J. "Device for holding photographic plates in developing trays." Filed Feb. 18, 1884. (No model.)

Claim.—1. The combination, with a developing-tray, of the sliding plate E, arranged to hold one end of the photographic plate, and adapted to be raised for lifting one end of the photographic plate out of the liquid, substantially as described.

2. The combination, with the plate E, for holding one end of the photographic plate, of the foot *f f'*, for holding the other end of the photographic plate, substantially as described.

3. The combination, with a developing-tray and spring-foot *f f'*,



for holding one end of the photographic plate, of a suitable detent, *i*, for holding the opposite end of the photographic plate, substantially as described.

4. The combination, with the detent *i*, for holding one end of the photographic plate, of the adjustable plate D, formed with the spring-foot *f f'*, substantially as and for the purpose set forth.

5. The plate D, having spring-foot *f f'*, in combination with the clamp C, arranged for holding the plate D, and adapted to be attached to the tray A, substantially as and for the purposes set forth.

6. The clamp C, formed with the spring-tongue *c*, spring-catch *d*, and lips *b*, in combination with the plate D, slotted and notched, and formed with the spring-foot *f f'*, substantially as and for the purposes set forth.

7. The combination, with the developing-tray A, of the sliding, holding, and lifting plate E, clamp C, and sliding plate D, held by the clamp C and formed with the spring-foot *f f' f²*, substantially as and for the purposes set forth.

PRESS NOTICES OF THE PHOTOGRAPHIC EXHIBITION.

[From the *Morning Advertiser*.]

The Exhibition can hardly be said to be disappointing, although there is little to be noted in the way of advance, either in the artistic qualities of the exhibits, or the scientific application of photography as compared with recent years. Some progress has, however, been made in the process of photogravure, and the specimens shown by Messrs. T. and R. Annan, of Glasgow, are remarkable for delicacy and mellowness of gradations. Klic's invention seems destined to become invaluable for the production of works suitable for high-class book illustrations, and Messrs. Annan are undoubtedly working it with great success. These monochromes are printed from copper plates, which are engraved by chemical processes, the tints resembling in their flatness water-washes of Indian ink or sepia. It is difficult to distinguish between some of the specimens of photo-engraving and carefully finished drawings in black and white, the resemblance being so close. Messrs. Annan have this year, as last, been awarded a medal for the scientific application of photography. Many of the best photographs are exhibited by non-professional gentlemen, who study the subject purely *con amore*, and are able to devote to it almost any amount of time and capital. In this category may be cited the frame of instantaneous views taken from a yacht in Scotland by Mr. T. W. Boord, one of the members for Greenwich; also the effective studies of flowers in vases by Mr. Henry Stevens, of King Street, Covent Garden. Captain Abney, R.E., F.R.S., again, is an accomplished master of the art, and the diversified subjects which he exhibits, produced from gelatino-iodobromide plates of his own preparation, are equal to anything that has yet been done by means of the camera. Several other non-professional photographers contribute excellent work. The combination pictures of Mr. H. P. Robinson are interesting examples of the artistic manipulation of photography. He has been awarded a medal for "The Mill Door," a work of real merit. In some other of his pictures the figures are not quite so natural, betraying by their pose their knowledge of the photographer's presence. At the same time it must be admitted that Mr. Robinson's productions are more free from this obvious defect than are those of most of his *confrères* who attempt combinations of figures and landscape taken on separate plates. The instantaneous studies of sea waves dashing on the shore, and mountains of feathery spray, exhibited by Mr. W. P. Marsh, have gained a medal. It would be useful if in these, and similar examples, it were stated whether there had been any retouching. It is difficult to distinguish in all cases whether the pencil of the artist has been employed or not, and any intimation with respect to this matter would be welcomed. In portraiture the practice of retouching is largely adopted, and does not debar the exhibitor from the Society's awards. It should be made a *sine qua non* in all such cases that a print from the untouched negative should accompany the hand-elaborated example. The spectator would then be able to discriminate between pure photography and skilled or unskilled—and it is more often unskilled than skilled—handicraft. The Photographic Society do not seem to distinguish by their awards the one from the other; and, although the novice can easily detect retouching more or less laboured here and there, it would be a point gained if he could, by comparing the negative print with the hand-finished performance, be enabled to judge of the quantity and the quality of the artist's work. Possibly some of the sitters might object to being displayed publicly without having their angularities and blemishes toned down, and their wrinkles obliterated; but, in the interest of photography, these scruples ought to be disregarded. There are exhibits in portraiture by Mr. J. Lafayette, Mr. J. E. Mayall, Mr. H. S. Mendelssohn, Mr. W. Byrne, by the London Stereoscopic Company, enlargements by the Woodbury Company of negatives by Messrs. W. and D. Downey, and a frame of comically-treated cats and dogs by Mr. H. Pointer, all worthy of commendation. Mr. Cecil V. Shadbolt, the æronaut, contributes photographs taken from the car of the *Monarch* balloon, on the 13th of August last, in an ascent from the Crystal Palace, and, as everybody cannot go up in a balloon, these views—one of them of streets, resembling a carpet of geometrical pattern—cannot fail to interest, altogether irrespective of any scientific merit or otherwise which they may possess. On the tables will be found an assortment of cameras, shutters, plate sets, lanterns, and other photographic paraphernalia, by different makers, and of the most recent pattern and approved type.

AN INSTANTANEOUS SHUTTER OF THIRTY YEARS AGO.

BY J. S. POLLITT.*

The shutter I have brought before you to-night is probably one of the oldest and, as I think, for absolutely instantaneous work, the best form of shutter extant. It was given to me some years ago by my friend Mr. Joseph Sidebotham, but for want of time and opportunity I have never, until quite recently, put it to a practical test.

It was made by Dallmeyer about 1856-7, Mr. Sidebotham having taken part in developing the principle, which is extremely simple. It consists of two light laths of mahogany, in each of which I will say, for simplicity, is a square opening (although in this particular shutter there are two openings in each lath, because it is a double one for stereoscopic work). When the focussing is done and everything ready, the exposure is made by touching a light trigger, when the two laths are instantaneously pulled in opposite directions, one square opening passing across the other, thus giving the centre of the lens the greatest benefit, as it is there the shutter first opens and last closes.

It will thus be seen that, however quickly a shutter may be made to work simply by a movable opening passing a stationary opening fixed to the front or inside the lens tube, as in the case of the drop shutter, if the stationary opening be converted into a movable one, and in an opposite direction, the exposure in the latter case will only be half the duration of that in the former case. It is precisely analogous to the passing of two express trains in opposite directions. Any slight opening between the trains seen by a person standing on the platform of a railway station at the time will be exceedingly brief as compared with an

* Read before the Manchester Photographic Society.

opening seen between a single train and a stationary object, such as the end of a building which may happen to be on the other side of the line of railway on which the train runs.

My object is not to depreciate any other form of shutter, for there are many excellent and deservedly popular ones now in the market; but I thought it would interest many to see an efficient instantaneous shutter which was made nearly thirty years ago, and I further think it will be admitted that the results I am showing you are sufficient proofs of its efficiency for what may be called extra-rapid work.

I must, however, point out that the details of construction are bad in two important particulars. The source of motion is an india-ruber band attached to each lath, the elasticity of which, when the trigger is liberated, draws them in opposite directions; and as each elastic band works on its own account, and quite independently of the other, there is a danger, by reason of the difficulty of getting the tension in both cases equal, that one lath may travel quicker than the other, which, in fact, I found on one occasion to be the case, when one-half of the plate was better exposed than the other half.

In the first place, therefore, I would have no india-rubber; it is an untrustworthy and perishable material, and liable to break or become useless when one has no chance of renewing it. In the second place, I would connect the two laths in such a way that one source of motion only, instead of two independent ones, would be required. Both of these alterations, I believe, could be readily accomplished by connecting the laths with a strong silk cord passing over a small ivory roller, and using as the source of motion a good watch or small clock spring. The speed of the shutter could, I think, also be altered within certain limits by means of the introduction of a brake action.

THE EXPERIENCES OF A BEGINNER.

BY ARTHUR B. FROST.*

1. An "Art" Study.
2. Waiting till the "clouds roll by."
3. A "rapid drop."
4. Coming to terms with models.
5. A selection from the best pictures.

6. "Please stand again: I forgot to put the slide in.
7. Artistic posing.
8. Out of gear for work.
9. "Never mind, I'll get some studies of animal life next time."
10, 11. Getting them.

Correspondence.

THE POTASH AND SODA DEVELOPER.

Sir,—We have lately heard a good deal of the potash and soda developers, some speaking for and some against them. May I be allowed to say a few words on the same subject, since it is by no means new to me, having tried these developers at least eight years ago with collodion emulsion plates, as some of the old editions of "Instruction in Photography" can testify. When gelatine plates came to the fore I also tried them, but with no advantage, it seemed then to me, over the ammonia developer. There are complaints from some that the sodium and potassium carbonates will not develop at times, but that a "drop of ammonia" is necessary to give them a start. Now, so far as I have read some formulæ, the necessity for addition of ammonia should be no surprise when the composition of the developer is taken into theoretical consideration. First we have sulphite of soda—of that I make no complaint; but then we have sulphurous acid as another ingredient, and given in terms of liquid ounces—at least, so it is to be presumed. Now, sulphurous acid at ordinary pressures is gaseous, and it can hardly be supposed that ounces of this are really meant. It may be supposed then to be a solution of sulphurous acid. If the equivalents of the neutral sulphite be calculated, and also the amount of sulphurous acid in solution, it will be evident that the poor monocarbonates or alkalies which we are told to add, stand a very poor chance of existence in any quantity, and, consequently, the alkalinity of such a developer must be

* From the *Chicago Eye*.

small; hence the suggestion of the addition of the ammonia to it. I would ask, Why use anything beyond pyro., the carbonates of the alkalies, and perhaps a slight restrainer? It is true that such a developer is apt to give a yellow stain, but the stain instantly disappears before a weak solution of hydrochloric acid, or any of the acid alum baths. My developing formula would stand thus:—

1. Pyrogallic acid—dry.

2. Mono-carbonate of soda (common washing soda)—a saturated solution at 60° F.

3. Potassium bromide—10 grains; water, 1 ounce.

Take 1 drachm of 2 and ½ drachm of 3, and add to them 3 grains of pyrogallic acid. Make up to 2 ounces, and develop as usual. When any fear of over-exposure arises, use ½ drachm of No. 2, and 1 drachm of No. 3.

Fix and wash, and then clear away the yellow stain as indicated above. The same formula may apply, using potassium carbonate instead of the sodium carbonate. I have not found the impurities which are said to exist in the commercial carbonates any drawback, though my experience with different samples is not extensive. The sodium salt I have bought at an oil and colourman's shop.

This yellow stain, which is so much objected to by some, can be entirely obviated by using *hydrokinone instead of pyrogallic acid*; at least, such is the case with all the plates that I have tried. The colour of the negative is a grey black, without a trace of stain on the transparent parts of the negative. What I have used is as follows:—

Hydrokinone	...	...	3 grains
Water	...	...	4 ounces

the sodium or potassium carbonates being mixed as before stated. Properly exposed plates may be developed without any restraining bromide; but if over-exposure is suspected, ½ drachm of No. 3, and half the normal quantity of No. 2, should be used. In the developing dish the solution becomes slightly inky-looking, but does not stain the film. I have found that excellent density is obtained on a properly coated plate. When a film is "starved" of silver—which is the case in several different samples of plates I have tried—of course only a certain amount of density can be obtained with any developer. But a comparison of a pyrogallic acid developed plate with one developed by hydrokinone shows an equal density in both. I have been asked if I would give up the use of ammonia for these carbonates, and at present I cannot say I would, rather, perhaps, from a feeling of conservatism than from any other cause. There is one advantage in the use of the carbonates, which is, that when solid they do not change appreciably in strength of alkali, whereas a solution of ammonia is always open to suspicion. I am told that the fumes of ammonia are injurious in the mucous membrane, which I can readily believe. The carbonates are certainly free from any evil attribute of this kind when merely used in development. I have also seen it stated that there is a liability for plates developed with these alkalies to frill: so far I have not had one that has, and I do not see why they should, more than with an ammonia developer.

6th October. W. de. W. Abney.

ENGLISH CAMERA MAKERS.

Sir,—We often hear of the decadence of English trade, and it may be well to point out, from time to time, defects which may give grounds for such a conclusion. There is a general complaint abroad that English goods are not what they used to be, and that orders upon English firms are not executed with the promptitude with which they used to be executed. My acquaintance with photography, and with photographers and photographic dealers, is not of long standing; but there is one principle to which I have heard frequent reference made, and which, if it really exists and is tolerated, is surely rather alarming. When complaining to professional photographers of inattention or bad workmanship on the part of photographic dealers, I have had it said to me: "Oh, but as an amateur you cannot expect to have such attention paid to you as to us; you cannot expect to have such good things sent to you as to us; all the worst things are given to amateurs; dealers have nothing to lose in such little custom as you may give them; but if they lose ours, it is a serious thing, and they take care to be careful." How far this principle is really carried out, I know not; but at any rate some such words have been said to me over and over again.

My own present and particular grievance is a small one. I came out here two years ago, not for the first time, to study a particular subject, and to make use of photography in illustrating it. I brought out two cameras by one of the most celebrated London makers, one for plates 8½ by 6½, the other a pocket camera, so-called, for plates 5 by 4. At the end of last winter, I found, when on the point of starting for the mountains, where my studies lie, that the slides of my pocket camera were (though I had not had them two years) defective. I thought of sending them to Marseilles or Paris to have them repaired, but a photographer friend said to me, "Send them to England; they will not only be better done, but you will have them back sooner than if you sent them even to Marseilles." So to England I sent them. I sent them to the maker with a letter requesting that they might be returned to me as soon as possible, and also requesting an estimate of the probable expense. A post-card, I said, would be sufficient to let me know about their arrival. Upon the receipt of that I would, I added, forward the sum due. The slides, as I heard from the agents to whom I consigned them at Boulogne, duly arrived at that port, and were transmitted from thence to London; but from that moment I heard nothing more about them. This was in the beginning of April. I waited two months, and then, still hearing nothing, wrote another letter to the maker begging him to give me some news about the slides, and also enclosing a cheque for an amount which I thought would cover the repairs. I also took the opportunity of forwarding two other slides, belonging to the larger camera. These in their turn arrived at Boulogne, and were duly announced to me by my courteous agents there, and were by them transmitted, as before, to the maker.

This second dispatch was in the beginning of June, but I heard no more about it than about the other. As in the former case, I waited two months for an answer to my letter; and then, in the beginning of August, finding the summer slipping away, and much inconvenience arising, I wrote another letter, asking for an answer of some kind, in order that I might know whether any of the things I had sent, or any of the letters I had written, had arrived. As before, I said a post-card would be quite sufficient for me, and I should not be in any way offended thereat. But to this day—and another ten months have now elapsed—I have received no answer of any kind whatever. In fact, six months have now elapsed since my first letter and the slides, and yet no notice whatever has been taken thereof.

One is accustomed to meet such treatment in the South of Europe, but I had hardly looked for it in England, and I venture to think that had I sent my slides even to Marseilles, I should have had them back, and perhaps a letter as well, months ago.—I am, sir, your obedient servant,

Bastelica, Corsica, Oct. 2nd J. W. Barry.

THE POTASH DEVELOPER.

Dear Sir,—The results which Mr. Jennings and others have obtained with the formula for a potash developer used by me and published in the News of Aug. 1st, I am glad to see, confirms all that I had obtained with it. For some brands of plates the amount of pyro stated is too great, and the only rule I can give is to suit the pyro to the plate, which can be ascertained easily by experiment.

To illustrate the difference in plates, and the wonderful adaptability of the developer, I recently developed ten plates (a fresh solution for each plate), subjects all interiors.

By using 3 ounces of water, 50 minims of pyro (or 5 grains), and only 20 minims of the potash solution, and not a bit of bromide, I secured beautiful, soft, clear, stainless, vigorous printing negatives. I believe, if pure chemicals are used, this developer will become universally adopted. Many of my friends have tried it with uniform success, and all commended it.—Yours respectfully, F. C. Beach.

New York, Sept. 26.

THE ROYAL ARMS CASE.

Sir,—Now that the case is over, and it has been definitely settled before a magistrate that it is not lawful to assume the use of the Royal Arms without proper authority, perhaps you will allow a word or two on the subject.

There appears to be a sort of feeling with some people that it was a pity anybody should be prosecuted for using the Royal Arms, or representing himself as photographer to the Queen, the Prince of Wales, or any of the Royal family. Why this should be must puzzle all thinking persons. To use the arms without authority is not fair to the public, to the members of the profession in general, or to those who have authority to use the arms. The arms could only be used without authority for the purpose of obtaining patronage by false pretences, the photographer well knowing that the British public—who, a Society paper assures us, are "nearly all snobs"—are led away by the thinnest pretence where the Royal family is concerned, and easily believe in any photographer who has the courage to put the Lion and Unicorn, or the three feathers over his door. It is not so generally understood that it is the smallest photographers who are apparently most patronized by royalty, especially the Prince of Wales. That kindly gentleman appears to sit to any photographer who is recommended to him by his servants. I think it is a fact capable of proof that the Prince has never been photographed by any English photographer of great reputation; the reason being that he seems never to send for a photographer, but falls a victim to any one who choses to disgrace his profession by touting.

H. T. Methven.

PLATES FOGGED BY THE LEATHER HINGE OF THE SLIDE.

Sir,—In the last number of the Photographic News is a short letter from Mr. J. D. England on plates fogged by the leather hinge of the slide. I have had a good number spoiled, I must believe, in this way, and should be greatly obliged if you would kindly inform me whether there is no other remedy than to replace the leather by vellum? The slides are all by a London maker, made, I suppose, in his usual style.—Sincerely yours, A. S. Dismore.

[If our correspondent has satisfied himself that the slides have caused the mischief, his best way will be to simply return them to the maker for prompt alteration or exchange. —Ed. P.N.]

THE PHOTOGRAPHIC EXHIBITION.

CLAIMING THE HONOUR DUE TO OTHERS.

Sir,—Your correspondent "Sacerdos" has certainly raised a question of much interest to all who wish to encourage straightforward honesty in photographic matters, and although he fairly chastises the so-called amateur who has nothing worth speaking of to do with the production of the exhibited pictures, I would suggest that there is a worse type of impostor around now-a-days. This is the newly-fledged professional photographer whose knowledge of photography is little more than nothing; he takes plates out, exposes them, gets somebody else to develop, enlarge, and retouch, after which he puts the picture into the market as his own. This would be all right and square enough if the gentleman put "professional photographer" on his front door, and did not claim to have made the pictures personally; but he does not do this, he calls himself an amateur, and takes refuge under this name when anybody comments on the badness of the pictures. I thought that this type of shuffler confined his operations to the West, but I find he is over here in great force. This is the kind of Bogus amateur against whom we agitate in the States; a man who is a badly qualified professional, and calls himself an amateur. We encourage and support the genuine amateur who never sells a picture. On my return to the States, I shall have to report to my friends the existence of the sham amateur in England.

Washington B. Strood.

Sir,—Might I suggest that it was never intended that the Exhibition should be turned into a shop with regular attendants? Some dealers have taken advantage of the fact that apparatus is admitted, to send a perfect cartload of things which are practically identical, which display no particular novelty in construction, and which cause a crowd to collect round the table to the inconvenience of those who desire to see the pictures. Last Monday evening this crowd completely blocked up the centre, so as seriously to impede locomotion.—Yours obediently,

One of the Inconvenienced.

Proceedings of Societies.

London and Provincial Photographic Association.

At the weekly meeting of this Association, held on Thursday, the 16th inst., Mr. A. Mackie occupied the chair.

Dr. C. Schleussner, of Frankfort, and Mr. Bell, visitors, were introduced by the Chairman to the members.

In reply to a question from Mr. A. L. Henderson, Dr. Schleussner, referring to the plates used in Germany, said their speed was about 22 on the sensitometer, ferrous oxalate being the favourite developer. It was considered quicker than pyro developer. The developer was made up of 17 parts of iron to 45 parts of oxalate—saturated solutions—development taking from three to four minutes.

A question was asked whether all the decomposed gelatine in an emulsion could be removed by washing?

Dr. Schleussner believed it could not; the rapidity of an emulsion depended a great deal upon the gelatine, whether acid or neutral.

Mr. Henderson had soaked gelatine in sulphuric acid—1 part to 40—for a day, using it subsequently after a thorough washing to emulsify with; negatives coated with this emulsion giving excellent results and very clear shadows, proving that gelatine usually contains substances that combined with the silver, forming compounds other than bromide.

Mr. Bell found chrome alum had a tendency to slow emulsions, and in cases of frilling had used 2 drachms of a 5 per cent. solution to 10 ounces of emulsion.

Mr. A. Cowan, with a view to test how long a neutral emulsion could be boiled without getting fog, had made seven batches of emulsion, boiling the first one three quarters of an hour, increasing the time with each batch; the last receiving three hours' boiling without producing a trace of fog. The first batch showed 17 on the sensitometer, the last 23.

Mr. Henderson said in this case Mr. Cowan was boiling in the presence of chloride of calcium, which acted as a restrainer. He (Mr. Henderson) would like to bring before the members a new modified method of making an emulsion which had been the subject of experiment with him. He gave the formula:—

1.—Gelatine	... ...	5 grains
Bromide of potassium	... ...	180 „
Iodide	... ...	2 „
Water	... ...	½ ounce

When dissolved by heat, add four ounces of alcohol; this will cause a precipitation or crystallization of the fine particles of the potassium bromide.

2.—Silver	... ...	240 grains
Water	... ...	½ ounce
Alcohol	... ...	4 ounces

Divide No. 2 solution into two parts. Add strong liquor ammonia to one of the parts until the precipitate is re-dissolved. Mix the two parts together and add No. 1 solution, the whole to be heated with water at a temperature of 120°, and 240 grains of dry gelatine stirred with it. When thoroughly incorporated and allowed to cool, the emulsion will precipitate itself, and the alcohol can be poured off, which, after filtering, can be used again. Mr. Henderson believed that the alcohol was in no way reduced in strength, as the gelatine absorbed the water. The alcohol, after pouring off, would be found to measure 7½ ounces.

Mr. Bell said he had two sensitometers of different degrees of density. He asked how either could be considered a standard.

Mr. Haddon thought the fairest test was to make a transparency in the camera.

Newcastle-on-Tyne and Northern Counties' Photographic Association.

The first ordinary meeting of the session was held in the College of Physical Science, Newcastle, on Tuesday, the 14th inst., at 7.30 p.m., Mr. J. P. Gibson in the chair.

The minutes of the previous meeting were read and passed, and Messrs. T. G. Gibson and Ruddock were elected members of the Society.

Mr. J. Pike (Hon. Secretary) said, that as it had been decided to postpone the transparency competition until December or January, it had occurred to him that a discussion on the best methods of making transparencies might be profitable, and that those who had any experience of this branch of the photographic art might be induced to allow their information to circulate amongst their less favoured brethren. Mr. Pike then read a short paper on "Transparencies" (see page 679), with special reference to the forthcoming competition. Hints were given and remarks made on the preparation of carbon transparencies, and those prepared on gelatino-chloride plates, samples of which were shown, together with the negatives from which they were taken. Speaking of the wet and dry collodion methods, Mr. Pike said he had had no practical experience, but he had asked Mr. Templeton to bring a few samples of wet-plate work, and that gentleman very kindly gave his experience of this method, remarking that he used the developer and toning solution mentioned in his (Mr. Pike's) paper.

Several questions were asked and replied to.

Mr. Downey, of South Shields, showed a large number of stereoscopic pictures and slides, which were highly appreciated.

Votes of thanks were passed to Mr. Pike and to Mr. Downey.

The Society's exhibition this year, of members' work only, will be held in November, at the Art Gallery. A presentation print is to be selected, and the medal and prize, offered by Mr. Borrow and Mr. Gibson respectively, competed for.

Glasgow and West of Scotland Amateur Photographic Association.

The usual monthly meeting of the above Association was held in their Rooms, 180, West Regent Street, Glasgow, on Tuesday, the 14th inst., Mr. Hugh Reid, President, in the chair.

After the approval of the minutes, the following new members were admitted:—Messrs. Wm. Orr, Henry Leask, H. M. Fraser, Wm. Leiper, John McKissack, George W. Gray. It was agreed to hold weekly informal meetings each Tuesday during the winter for the discussion of general photographic matters, and to enable members to know each other better.

Mr. W. Lang, Jun., then read his paper, giving a short resumé of the photographic progress of the current year (see p. 678). Mr. Lang's interesting paper was illustrated by a number of specimens of the various methods of photo-mechanical printing kindly lent by Mr. J. Craig Annan and others. Mr. Lang afterwards, to demonstrate the value of some of the new methods, reduced and intensified a number of negatives in a completely successful manner.

After some general conversation, the meeting adjourned.

Manchester Photographic Society.

General Meeting.

The first meeting of the present session was held in the Manchester Technical Schools, on Thursday, September the 11th, the President, Mr. Jno. Pollitt, in the chair. The minutes of the previous meeting were read and confirmed.

The President made reference to a subject that had been under discussion at the Council meeting, viz, the scarcity of papers being read by members, and in response to his call, Mr. Brothers volunteered a paper, and to give a practical demonstration on the Daguerreotype process.

Mr. Alan Garnett exhibited a charming collection of small landscapes, taken during a recent tour in Normandy; and exhibited a mask which he introduced in his camera, enabling him to make four exposures on one plate, and also a series of four or five prints forming a panoramic picture, in which the joinings were scarcely perceptible.

Mr. Wilson exhibited some prints from negatives taken at the outdoor meetings of the Society.

Mr. McKellen showed a fine series of photographs taken on the occasion of the Society's visit to Kirkstall Abbey.

The Hon. Secretary exhibited a new lantern carrier, made by Mr. Stewart, of London, by which slides of various sizes were automatically registered.

The meeting was brought to a close by a lantern exhibition by Mr. J. A. Chadwick, consisting of a series of Parisian and other views.

The annual meeting of this Society took place in the rooms of the Society, at the Manchester Technical Schools, on Thursday, October 11th, the President, Mr. J. Pollitt, in the chair.

The minutes of the previous meeting were read and confirmed.

The Hon. Secretary read the annual report as follows:—

"This being the twenty-ninth annual meeting of the Society, your Council have to congratulate you upon the very successful year we have just passed through. It is satisfactory to be in a position to state that, notwithstanding the heavy calls which have been made upon our exchequer this year by the exhibition in December last, our funds have increased beyond all expectations, our present position being better than has ever been known since the Society first came into existence. Although we have had 32 new members added to the list, we have to record several resignations, our numerical strength being now 130, against 113 last year. It is satisfactory to find that the average attendance at our monthly meetings has increased to 59, against 51 last year. We are, however, sorry we cannot boast of the number of papers read during the present session, but it is with pleasure we reflect upon the general interest which has pervaded our gatherings. Undoubtedly, the principal event of the year was the exhibition in December last, being chiefly the work of our own members, together with the choicest work of the leading photographers in Great Britain, and supplemented by a unique collection of photographic work collected from all parts of the world by our esteemed member, Mr. Charles Harris, who also contributed to the interest of the exhibition by a short recital of his experiences of the photographic brethren in America, India, China, and Japan. Not the least interesting event of the year was the presentation of a testimonial to the Hon. Secretary, Mr. W. J. Chadwick. That gentleman having filled the office for the past seven or eight years with so much ability and tact, besides having some time previously matured and carried into effect a scheme for placing the finances of the Society on a much sounder basis than had ever before existed, it was thought by many of the members that some substantial recognition of such long-continued, active, and purely voluntary services should be made. It was not intended, however, from the first that the funds of the Society should be drained upon for the purpose; nor was it intended, beyond the mere sending out of circulars to members apprising them of what was proposed to be done, that any solicitations for subscriptions should be made, or any canvassing resorted to. The matter was entertained in a spirit of great liberality by a large proportion of the members, and the testimonial took the form of a very handsome gold watch and guard, which was presented by the President, on behalf of the subscribers, on the occasion of the soiree by which the December exhibition was inaugurated. The ceremony took place in the presence of a large and select company of visitors, and Mr. Chadwick, labouring under some emotion, made a graceful acknowledgment of the gift. On the same occasion our valued friend and old member, Mr. John Holding, artist, presented the Secretary, on his own account, with a beautifully-executed water-colour drawing from his own pencil. We must not omit mention of our old member, Mr. W. B. Woodbury, who came down from London specially to exhibit to us and demonstrate the working details and manipulations of the stannotype process. We have also to record, amongst the papers

read, one from the President, 'On the Attitude of our Society: Past, Present, and Future'; and another from the Hon. Secretary, being a series of suggestions of subjects that might be advantageously taken up by most of the members for research and demonstration at our meetings. Mr. Rishton read an interesting paper 'On Swing-Backs and Swing-Fronts,' illustrating his remarks by an ingenious model of a camera in section, which he afterwards presented to the Society. The Hon. Secretary gave another short communication on 'Landscape Lenses and Diaphragms,' with a few elementary remarks for the benefit of the younger members of the Society. Mr. Greatorex gave an interesting and highly-amusing paper, entitled 'A Summer Holiday,' consisting of notes taken during a recent tour in Switzerland. Mr. Edwards followed by a paper advocating the importance of rising-fronts, and exhibited several negatives intended to demonstrate the superiority of rising-fronts over swing-backs. The President dealt very ably with the same subject in another communication, and conclusively proved to the members that the rising-front was a more valuable addition to a camera than a swing-back. Besides the above, many other subjects of interest have been brought before the members, including a demonstration of the manipulation of gelatino-bromide paper, by Mr. McKellen. The lantern has upon more than one occasion been successfully handled by the Hon. Secretary and his brother, Mr. J. A. Chadwick, and generally the meetings have been well supplied with novelties in apparatus and members' work, amongst which may be mentioned a series of large pictures by Mr. McKellen, and some charming smaller studies by Mr. Alan Garnett. Mr. A. Brothers also exhibited some fine micro-photographs, taken by the aid of the electric light. Before closing this retrospective survey of the past year's proceedings, we must acknowledge the unprecedented success of our out-door meetings, which have been, with few exceptions, well attended and enjoyed by all present. And now, in resigning our respective offices, we again congratulate you on the satisfactory condition of the Society—not only in its financial status, but also upon the harmonious feeling which has characterised the whole proceedings."

Mr. William Watts said he thought a very important event had been omitted from the Report, viz, the presentation to the Hon. Secretary of a testimonial for his past services.

The Hon. Secretary submitted that it was omitted, but being a testimonial from the members of the Society, and not really a gift of the Society as a body, he did not mention it in the report. However, as many of the members expressed a wish that the subject should be included in the report, the Hon. Secretary, with his usual modesty, said he would prefer that the President receive the report from his hands as it now read, and that he (the President) might alter whatever he thought best. With this understanding the report was accepted.

A printed copy of the annual balance sheet was next handed round to the members; and in proposing the same be accepted, Mr. William Watts complimented the Council upon their able management of the Society's affairs during the past year.

The election of officers next took place by ballot, resulting as follows:—

President—Mr. J. S. Pollitt.

Vice Presidents—The Rev. Canon Beechey, Dr. C. P. Bahin, M. A. Brothers, F.R.A.S., John Dale, and J. W. Leigh.

Council—R. Atherton, Alan Garnett, Joseph Greatorex, Charles Harris, F.R.G., John Kershaw, S. D. McKellen, E. Openshaw, John Schofield, John Warburton, and M. Wright.

Hon. Treasurer—W. G. Coote.

Hon. Secretary—W. Chadwick.

During the scrutinizing of the voting papers, Mr. J. Greatorex exhibited a negative much fogged with patched dense markings; this was one of a batch of excellent plates, and the only one found defective. No explanation was offered, but many members said that they had met with similar experiences.

Mr. W. Blakeley exhibited a number of excellent prints, the work of a friend, who was desirous of becoming a member of the Society, and whom he would propose at the next meeting.

Mr. Livesey exhibited a number of splendid photographs, 10 by 8, very neatly mounted; they composed a series of views in Scotland.

The President (Mr. J. S. Pollitt) exhibited an instantaneous shutter, made more than thirty years ago, and read a short paper describing the same. He also exhibited some charming stereoscopic views, and lantern slides for instantaneous negatives taken by the aid of this shutter (see p. 682).

Mr. Alfred Brothers exhibited a portrait taken about 1856 or 1857, and which he supposed was the second C.-D.-V. portrait taken in Manchester.

A general discussion took place on shutters and instantaneous exposures, in which the President, Jno. Chadwick, sen., S. D. McKellen, Schofield, and others joined, resulting in the general approval of shutters of the Noton type.

Mr. Wm. Watts exhibited a walking-stick camera tripod-stand, which opened out to five feet three inches in height, and was so firm and rigid that it supported easily a weight of 30 lbs. When closed, it resembled a bamboo walking-stick, with buck-horn handle, silver mounted; its weight was one pound to one pound seven ounces.

Mr. Jos. Greatorex exhibited a number of lantern slides by the wet collodion process, Cowan's plates, and collodio-bromide process.

Owing to the lateness of the hour, the lantern was not used, but the Hon. Sec. said he would arrange to have the lantern working at the November meeting, and hoped all members who intended to send slides would confine them to the standard size—viz., $3\frac{1}{4}$ square, and accompanied by a list of number of slides, and exhibitor's name, and desired that members would send up their slides before the last minute, in order to insure their safe return, as it was extremely perplexing for a lanternist to have slides put into his hands during the exhibition by two or three different people, and ensuring each a safe return.

The next meeting will take place November 13th, at which, besides the lantern exhibition, Mr. Alfred Brothers will demonstrate the Daguerreotype process.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will be held in the Gallery, 5A, Pall Mall East, on Tuseday next, October 28th, at eight p.m., when the apparatus now in the Exhibition will be brought forward and explained.

Yellow Light for the Dark Room.—We notice with pleasure that our German friends now recognize the advantage of illuminating the dark room with yellow light. Some few months ago, Mr. W. E. Debenham advocated the use of yellow paper in connection with pale green glass as a means of filtering the actinic rays. Quite recently, Dr. Liesegang described in the *Archiv* the results of his experience with the so-called "Golden Fabric," the material subsequently adopted by Mr. Debenham, and originally introduced at the suggestion of Mr. Zaehnsdorf. In Dr. Liesegang's dark room there are fitted two windows, the one being glazed with ruby glass and covered with one layer of yellow fabric, and the other glazed with ordinary window glass and covered with two thicknesses of the fabric. When it is only required to examine the plate from time to time during development, a bent metal screen should be placed between the window and dish. The two layers of fabric answered perfectly during the summer months, the negatives being entirely free from fog. The same material also proved equally useful to replace the ruby glass in a dark room lantern, and Dr. Liesegang quite recently developed a large batch of instantaneous plates with such a light; a piece of the material, 30 by 15 inches, was folded twice, thus giving a thickness of four layers, and placed between a burning candle and the developing dish, without taking any means to stop out the back and top light. During development, the dish was covered with a ferrotype plate, and the latter was only removed when it was necessary to observe the process as it proceeded. The plates, without exception, developed free from fog.

Purification of Methylated Spirit.—Cazeneuve and Chapuis have made experiments to discover to what extent the French methylated spirit, which is prepared by mixing wood spirit, containing about 25 per cent. of acetone, with ethyl alcohol, can be freed from its objectionable odour. By the action of nascent hydrogen from a zinc and copper couple placed in the spirit at a temperature of about 70°, the disagreeable odour is completely removed after the reaction has gone on for five or six days. The same result can be obtained by using a zinc and copper couple in the cold, but the process takes about four times as long. By distilling a mixture from a water-bath, nearly odourless spirit is obtained. The result is obviously due to the conversion of the

acetone into secondary propyl alcohol by the action of the nascent hydrogen.

A Desideratum.—Mr. A. Anson, of Balliol College, writes:—"A papier-mache tray, with deep sloping sides, the bottom of which is no longer, but slightly narrower, than the plate in use. In this tray two plates can be washed or fixed at the same time back to back. The lower one cannot touch the bottom of the tray, as it is supported by the sloping sides, whose base is narrower than the plates. It is also an advantage, in this tray, that single plates can be washed or fixed film downwards, so that the sediment falls to the bottom. I have with me a tray bought in Paris, which will hold two 5 by 4 plates, or two quarter-plates, in this manner."

The Study of Photography.—The *Magazine of Art* says:—"The application of photography is now so extended and varied, and its practice is so simplified, that it appeals to all classes and professions, as well as to those who are attracted to photography for its own sake. It is equally useful to the architect and engineer, to the archæologist and the sculptor, the painter of landscape and cattle, and the tourist who values his reminiscences of travel. With ladies, too, it is fast becoming a veritable hobby; it involves no risk of accident, of burnt and blackened hands, and injured dress."

German Photographers.—In the *Deutsche Photographen Zeitung* are given some interesting statistics concerning the proportion of employés to photographers in German towns, as also the relative number of photographers to the population in the German Empire. As might be expected, the larger the town, the greater is the number of employés in each establishment. The following table shows in the first column the number of assistants to every hundred principal photographers in different sized towns:—

38	in villages	containing	under	2,000	inhabitants.
40	in small towns	„	„	5,000	„
77	in country „	„	„	20,000	„
138	in provincial „	„	„	100,000	„
216	in large „	„	over	100,000	„

It should be noted that in villages and small towns a great many photographers combine with their business that of an optician, or something else, and thus the above numbers can only be considered as approximately correct. In Berlin, with a population of 1,156,755, there are 627 photographers and their assistants, and thus to every 1845 inhabitants there is one photographer, while in the German Empire, out of a population of 45,222,113, there are 3,284 photographers with 3,585 assistants, and thus out of every 6,584 inhabitants, one person works at photography.

A Picture for his Wife.—A man entered a photographer's and said: "I want a cabinet picture of myself?" The artist placed him in position and screwed up his machine to the proper focus. "Now look bright and cheerful," he said, "and keep your eye fastened on that hole in the wall." Instead of looking bright and cheerful, the man concaved himself forward, dropped his jaw, and assumed a look of infinite weariness. "What's the matter with you?" exclaimed the photographer. "Brace up, I say, and look pleasant." "If this position costs anything extra," was the answer, "I am willing to pay for it. My wife is up in the country visiting friends, and this picture goes to her. I know what I am about. Pull the blanket off, Mr. Artist, and begin counting."—*Detroit Free Press.*

A New Journal.—The Magyars are to have a photographic monthly in their own tongue. A Mr. F. Veresez, of Klausenburg, will be the editor.—*Anthony's Bulletin.*

Photographic Club.—The subject for discussion at the next meeting of this Club will be on "Reversed Negatives."

To Correspondents.

*** We cannot undertake to return rejected communications.

J. E. B.—It has been sent on to Mr. Brooks.

Butler Humphrys.—We are sorry to say that we do not know the address of the gentleman referred to.

G.—1. The best is a thorough washing in abundance of water, and the expedient you referred to should only be used when there is a difficulty in obtaining a good supply of water. 2. The special objection is, that it tends to make the paper rotten.

W. A. C.—1. The picture referred to has certainly been over-exposed; perhaps it has had double the best exposure. 2. We can hardly suggest the reason without knowing more. Try fuming your paper with ammonia (see page 346 of present volume). 3. One special advantage of Beach's potash developer is the circumstance that in case of over-exposure, mere dilution with water is sufficient. 4. As regards the prints, we must speak very highly of them as a whole, but No. 7 shows signs of under-exposure.

Beginner.—Obtain Captain Abney's "Instruction"; the book you mention is very elementary, and contains no information regarding the matter you refer to.

Mai-Kama.—We should advise you to call on Mr. W. Ackland, of 416, Strand, and to take his advice in the matter.

B. L.—It depends altogether on the article itself, and if the configuration of the article is novel, you can register the design at a moderate cost by applying at the Design and Trades-marks Registry. If, on the other hand, the novelty merely consists of a particular arrangement of photographs on a card, we do not think your application will be entertained, unless the prints are so placed as to themselves build up some pattern or design which can itself be registered. You doubtless know that any individual photograph can be protected at a cost of 1s. 7d., by registration at Stationers' Hall.

M. Breithardt.—Obtain the cement used for fastening tricycle tyres; several qualities are sold, but be sure to obtain the best kind, which contains a good deal of india-rubber. Make the glass hot, rub the surfaces with the cement, and clamp together, leaving the clamps on till the glass is quite cold.

J. James.—The system is applicable to plates of any sensitiveness, but in judging exposures, success will depend largely on the individual experience of the worker.

G. H.—The curious way in which you have misunderstood the remark amuses us.

A. G. B.—Your experience is interesting, and we shall ask you to be kind enough to write a short paper on the subject. 1. To allow the easy separation of the films. 2. It does, and the paper might be used a second time if it were worth while to do so. 3. The copper compound would be likely to do mischief; and we should therefore recommend ordinary paper, or the so-called vegetable parchment. 4. The gelatined paper is sold by Dr. Liesegang, of Dusseldorf. 5. Ordinary plain collodion, containing about 5 grains of pyroxyline to the ounce.

Musicus.—Your work is very much improved, and we especially congratulate you on the picture which you contribute to the Pall Mall Exhibition. This will be noticed in due course, and we shall be glad of your permission to reproduce it in our columns.

*** Several answers must stand over till next week.

Photographs Registered.

Mr. Bateman (Canterbury)—2 Photos. of "The Kent Eleven" Cricketers.
Messrs. Welch Bros. (Landport)—Photo. of "John Pound's" House, Landport.
Mr. F. W. Broadhead (Leicester)—6 Photos. of Officers, &c., Leicester Rifle Volunteers.
Mr. J. Losh (Lowmill, Dalston, Cumberland)—2 Photos. of the "White Swan" Inn, Carlisle.
Mr. J. Moffat (Edinburgh)—3 Photos. of Mr. W. E. Gladstone; 3 Photos. ditto, and Lord Northbrook and others; 1 Photo. of Prince and Princess of Wales, and Family; 1 Photo. of Lord and Lady Rosebery and others.
Mrs. E. E. Cox (Nottingham)—6 Photos. of Cats.
Mr. A. J. Tagliaferro (Malta)—Photo. of Interior of St John's Church, Malta; Photo. of Monument of Emanuel Pinto in St. John's Church, Malta.
Mr. W. H. Bustree (Hereford)—2 Photos. of Lord Wilton's Hereford Cattle.
Mr. R. Hammond (Bacup)—4 Photos. of Mrs. Hadfield.
Mr. Blackett (Woburn Square, W.C.)—Photo. entitled "Thisbe."
Mr. H. P. Robinson (Tunbridge Wells)—Photos. of Scenery, &c.

The Photographic News.

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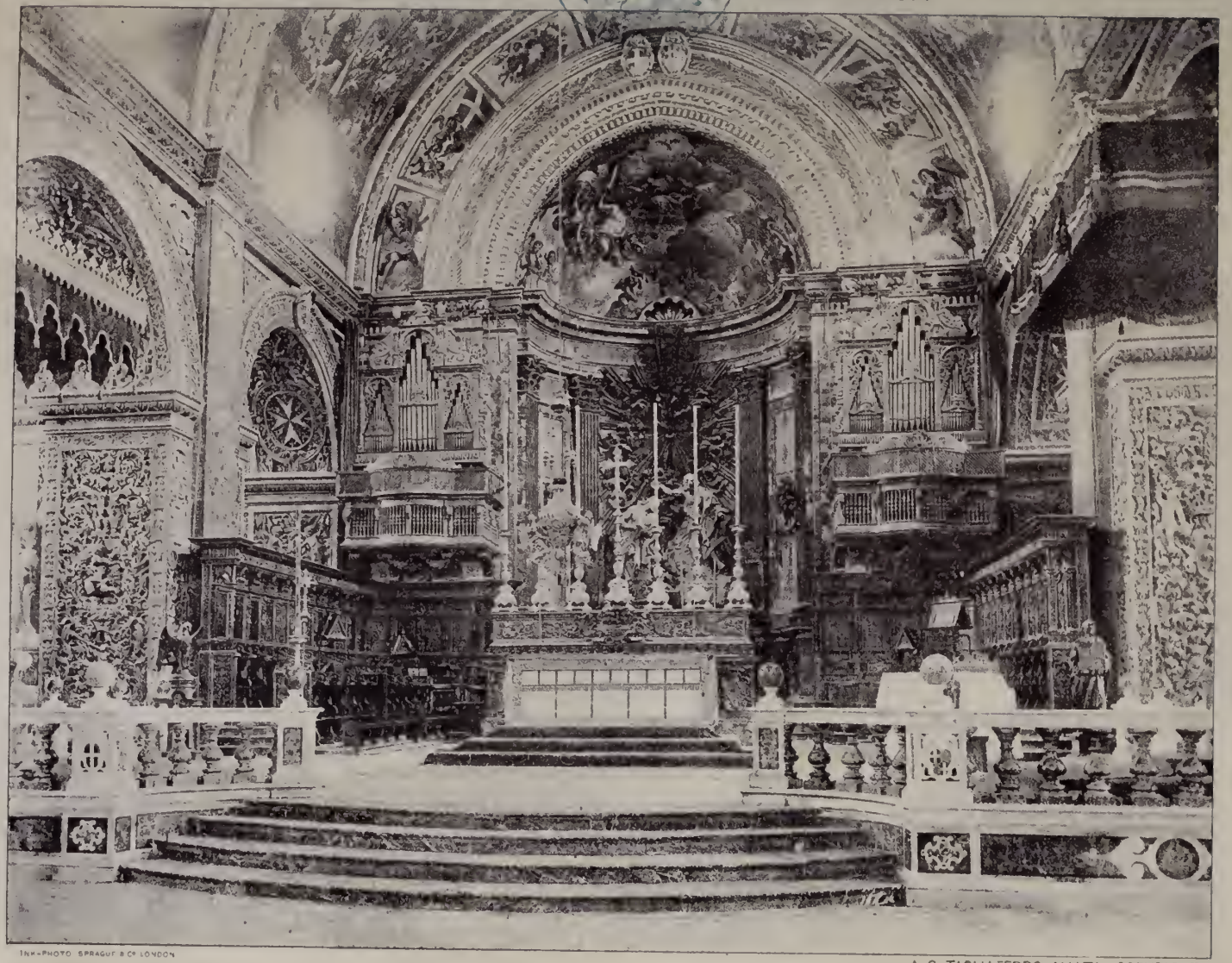

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1365.—*October* 31, 1884.

CONTENTS.

M. GRASSIN'S PHOTOGRAPH OF AN EXPRESS TRAIN.

ALTHOUGH one has seen several pictures of express trains taken at full speed—or, at any rate, photographs which were said to have been taken while the trains were in rapid motion—we believe that in M. Grassin's picture, which forms our supplement this week, we have the first authentic photograph of an express train taken broadside on. Among the express train pictures which have been exhibited, may be mentioned one in which the clouds of vapour were diffused in masses round about the funnel of the engine, a condition of things by no means consistent with rapid motion; while in the case of another "express photograph," our readers will remember that the signals were shown as being against the train.

The picture which forms our supplement was taken nearly two years ago, and was exhibited at the International Exhibition of photographs held in Brussels last year. In this case it was honoured with a medal; and, as already mentioned, M. Grassin has been awarded a medal by the Pall Mall judges this year.

The train represented is the well-known international mail of the splendid service between London and Paris, and it seems to us to have been taken just opposite to the Portland Cement Works which one passes after leaving Boulogne for Paris. The exposure is estimated as being one three hundredth of a second, and the speed of the train as forty-two miles an hour. The amount of actual motion during the exposure may be judged of by an inspection of the crank-arms attached to the driving wheels, and comparing them with the comparately sharp connecting rod; and one need only look carefully at the back-stream of vapour to detect the rythmic waves which correspond to each action of a cylinder chamber, or to one-fourth of the circumference of the driving wheel. As a genuine illustration of what can be done by the camera in the present day, M. Grassin's picture possesses much interest, especially as compared with the frauds which have been put forward as "express train" pictures.

THE PALL MALL EXHIBITION.

FOURTH NOTICE.

MR. GEORGE PITT'S portrait of a lady (No. 51) does not strike us as being remarkably good, the heavy and somewhat exaggerated shades on the face being a little too pronounced, while the hand nearest the lens is magnified so much as to be very noticeable; but No. 82, a portrait by the same gentleman, is better as regards the pose and lighting. "On the Skirts of the Downs," by Mr. J. Gale (No. 52), shows us a flock of sheep on a grassy slope; but we do not like this picture quite so well as those coming afterwards under Mr. Gale's name. "Off to Market—you'll take care of Baby?" (No. 69), has an air of truth which makes it a good picture. The mother, in leaving her babe with the girl, evidently expects to find it safe on the return. No. 70 is a curious study of light and shade in the mouth of a cave; while No. 71, "Oh Rye, Oh Fie;" 72, "Spinning—a Highland Doorway;" and No. 83, "Mowing at Cowdray," are effective pictures of rural life. The "Studies of Cattle," No. 55, by J. Beasley, Jun., although small, possess much merit, and the same remark applies to his "Morning Chat," No. 73, in which the old cottager is evidently enjoying the usual half-hour of gossip. "A Folkestone Fisherman," No. 74, and "Off Brighton," No. 75, are both good; the latter being a little out of the usual run, as it is taken directly in the face of the light. In No. 84, "Etter Water," "Rydal Water," and "Brathy Bridge," we have true pictures made by the camera, the old ivy-grown bridge being particularly attractive.

Two pictures of "Ashwood Dale, near Buxton" (Nos. 56 and 57), are two of four exhibits by the Hon. Mrs. Holden-Hambrough. These are delightful bits of woodland scenery on 12 by 10 plates, fully exposed so as to well bring out all details, and possessing great technical merits, as well as artistic qualities; while the remaining two pictures (Nos. 85 and 86) show us "Dorothy Vernon's room and steps at Haddon Hall," and "The Terrace at Haddon Hall." From Mr. Clive F. Pritchard there are three exhibits at Pall Mall; (No. 58) "Clivedon-on-Thames," (No. 59) "Clare Bridge, Cambridge," and (No. 60), "Clivedon-on-Thames;" and he has been successful in making pleasing little pictures of his subjects. "Three Children of Arthur à Beckett, Esq.," by Barraud, and enlarged by the Autotype Co., is a good group, and well enlarged; but it is difficult to see any special qualities which should entitle it to a place in the Exhibition.

"Luncheon Time" (No. 76), by Mr. B. Wilkinson, jun., and its companion picture, "Early Spring" (No. 77), show us the plough at rest, and the plough at work; while in No. 90, "Fence Making," by the same gentleman, we see another phase of field work: the remaining exhibits of Mr. Wilkinson (192 and 193) are like those referred to above, country scenes.

A good picture of pussy is always attractive, and it is a pity that Mr. Pointer's excellent enlargement on opal (No. 78) is placed so low down. The long-haired white Persian cat is sitting on a newspaper, with an air of resentment for some slight indignity offered her. Who knows better than Mr. Pointer how to depict with the camera all the graces and attitudes of the cat, and to say a cat picture is by Mr. Pointer is to say it is good! In No. 380 we have a frame of cats and dogs by the same exhibitor.

The Hampshire Cottage of Mr. C. A. Fernley shows us the thatched cottage in its most pleasing aspect—that is to say, with the sunlight streaming down on the outside; while the "Views in Surrey" (Nos. 537 and 558) show us other pleasing phases of country life. Mr. Fernley's photographs are pictures, and contain none of the heavy and detailless masses of black which often spoil landscape work.

"Studies of Pampas Grass," by J. Bracebridge Hilditch, is a difficult subject well executed, and Mr. Hilditch also deserves credit for the good qualities possessed by his remaining exhibits, "Can I trust you?" (No. 102), "Feeding the Swans" (No. 454), "The Thames at Richmond" (No. 476), and "Cholmondley Walk, Richmond" (505).

It is not often that such a good opportunity occurs for obtaining a photograph of Pilatus as Dr. Plaister had when he secured No. 89, "Lucerne with Pilatus"; and a view which so well shows the mist-clothed monarch is likely to be valued by those who know the locality.

In No. 91, "G. Grossmith, Esq.," we have a commercial portrait, and nothing more; and now-a-days commercial portraits are made partly by the camera and partly by the retoucher's pencil, one hardly feels that they are quite in their proper place in a purely photographic exhibition.

An exhibit of real and permanent interest is the frame of photographs (No. 93) sent by Mr. W. J. A. Grant to illustrate the sixth cruise of the Dutch schooner *Willem Barentts*. Of these we shall say more on a future occasion.

The enlargement on gelatino-bromide paper (No. 98), sent by Messrs. Morgan and Kidd, shows conclusively the value of the process, but the large hands spoil the exhibit as a picture.

Mr. R. H. Lord, of Cambridge, has succeeded in making an admirable picture of the new Archæological Museum at Cambridge, the subject being an especially difficult one to deal with; and Mr. Lord's other exhibits (Nos. 320 and 341), consisting of eighteen pictures showing characters

from the "Birds of Aristophanes," as performed at Cambridge in November of last year, also possesses special merits. These latter are interesting as exemplifying striking phases of facial expressions, and we select two for reproduction. The first represents the adventurer Peithetairos (Mr. M. R. James) endeavouring to persuade the Hoopoe (Mr. F. R. Pryor) to establish the aërial bird-city, which should in time govern both gods and men; but the Hoopoe looks very doubtful as to the success of the enterprise, although he ultimately yields to the persuasive talents of Peithetairos.

The other photograph, which we also reproduce as a Meisenbach block, shows a scene in which Peithetairos and

Euelpides are represented as being a little embarrassed about certain details relating to the formation of the proposed new city. A book of the play, illustrated with the complete series of Mr. Lord's pictures, would form an interesting album.

THE EFFECT OF LIGHT IN RELATION TO THE SOLUBILITY AND PRESERVATION OF GELATINE EMULSION.

In a recent issue of the *Wochenblatt*, Herr Schumann describes a series of experiments on the action of light on gelatine emulsion, which may possibly have some bearing on Mr. Burke's researches as to the production of an insoluble image on an argentic gelatine film, when treated with the usual pyro developer. Herr Schumann finds, however, that the use of pyrogallic acid is not essential to the formation of insolubility; on exposing emulsion jelly to the action of the sun's rays for some days, he found that the external surface becomes completely insoluble in hot water, and is not disintegrated even after some hours' digestion in boiling water. As our readers are aware, gelatine emulsion containing no antiseptic decomposes in summer weather in four or five days, but Herr Schumann finds that when emulsion is placed in daylight for a week or so, no decomposition appears to take place, this fact being probably due to the bromine, chlorine, or iodine liberated from the silver salts

y the actinic rays, acting as preservatives; also it is possible iat the insolubility before referred to is produced by the ombination of the halogen with gelatine, for it is well nown that aqueous solutions of bromine, chlorine, and odine have a tanning effect on gelatine.

THE HYDROCHLORATE OF HYDROXYLAMINE DEVELOPER.

We have recently been making experiments in the new eveloper described in the PHOTOGRAPHIC NEWS by Messrs. arl Egli and Arnold Spiller. The substance which forms ie active constituent of the developer goes by the formidble name which we have given as a heading.

Mr. Arnold Spiller was good enough to give us the prese formulæ which he is now using, he having varied it ightly since the article on the developer appeared in the HOTOGRAPHIC NEWS. We copy out word for word his istructions:—

"A.—Hydroxyl. hydrochlor. ... ... 32 grains
Citric acid ... ... 15 ,,
Potassium bromide ... ... 20 ,,
Water ... ... 1 ounce
"B.—Caustic soda ... ... 1 drm. (60 grs)
Water ... ... 1 ounce
"C.—Potassium bromide ... ... 20 grains
Water ... ... 1 ounce

"To develop a 7½ by 5 plate, I take 1 drachm of A, 3½ unces of water, and to begin with 40 (not 20, as stated) rops of B; then, as the operation proceeds, another 20 or o is added, *if necessary*."

On analyzing these quantities, we find that the deve-per, after the addition of the first 40 drops of B, con-sts approximately of—

Hydrochlorate of hydroxylamine ...	1·08 grains
Bromide of potassium	·7 grains
Caustic soda...	1·32 grains

each ounce of developer.

To facilitate the trying of variations in the constituents, e made up the stock solutions, not as given by Mr. piller; but we made up a ten per cent. solution of each the three constituents of the developer, keeping the roportion of citric acid to hydrochlorate of hydroxylamine e same as that just given.

We then exposed a number of plates for the same length time, one set under the sensitometer, another set in the mera, to a statuette. During all experiments, we deve-ped one sensitometer-exposed plate, and one camera-xposed one, side by side.

We first of all developed a pair of plates by the ordinary ro developer, so as to be able to have a standard with hich to compare those developed by the new developer. As a sufficiently close approximation to the formula ven by Mr. Spiller, we first tried a solution containing—

Hydrochlorate of hydroxylamine ...	1 grain
Bromide of potassium...	½ grain
Caustic soda	1½ grains

each ounce.

With this it was a very long time before any image mmenced to appear—nearly quarter of an hour—and velopment progressed so slowly after something did pear, that we despaired of ever getting sufficient density detail. We therefore added caustic soda freely—too ely, apparently—because although we got detail enough er some little time, we got fog also.

On looking for a reason for the extreme slowness of the velopment, it struck us that the quantity of citric acid commended is very large, and on making the experiment found that to neutralize the solution containing one grain of hydrochlorate of hydroxylamine, required very nearly one grain of caustic soda; so that with the developer given by Mr. Spiller, there would be but very little caustic soda left to accelerate development after the acid was neutralized; besides which, there would be formed in the developer a large proportion of citrate of soda, which is a powerful restrainer.

Taking this into consideration, we next tried the following solution:—

Hydrochlorate of hydroxylamine...	1 grain
Bromide of potassium	*nil.*
Caustic soda	2½ grains

to each ounce of developer.

This gave a far more satisfactory result. The development proceeded with much greater rapidity than before, although by no means so quickly as with ordinary pyro developer. The only fault to be found with the final result was that the negative was too thin. There was no trace of fog, from which we conclude that no soluble bromide is necessary as a restrainer with the hydroxylamine developer.

We tried one more pair of plates, using twice as much hydrochlorate of hydroxylamine as before, and using also somewhat more caustic soda.

Our developer now consisted of the following:—

Hydrochlorate of hydroxylamine ...	2 grains
Caustic soda	3 ,,

to each ounce.

This gave us an excellent result. There was not a trace of fog, nor in the fixed negative the slightest trace of discolouration. The colour of the deposit was a steel blue, which left nothing to be desired. In the case of the plate exposed under the sensitometer, the same figure was got as with the pyro developer. The only fault which could be urged against the developer is, that with the particular plates used, there was a slight reticulation of the film, doubtless due to the caustic alkali. It is only fair, however, to say that the particular sample of plate used was an exceedingly rapid commercial one, in which the films are very soluble, either on account of a soft gelatine being used, or on account of long digestion of the emulsion being employed to give sensitiveness; also that the addition of 15 per cent. of methylated spirit prevented the reticulation, although the time taken for development was increased.

It should be mentioned that the solution scarcely discolours at all during development, so that it may be used repeatedly. It must be borne in mind, however, in this connection, that whenever a bromide plate is developed, bromine is liberated, and absorbed by the developing solution. Probably, with the developer just given, it will combine with the caustic soda to form bromide of sodium; but whether it does or not, a powerful restrainer will be added to this developer.

Finally, we may say that, as the first experiments with a new developer, the results have pleased us greatly.

We unfortunately mixed the whole of the hydrochlorate of hydroxylamine which we had with citric acid and water, as directed by Mr. Spiller, otherwise we should have tried the effect of using a greatly reduced quantity of citric acid, or even none; the impression conveyed to us, even during our last experiments, being that we were using a developer far too powerfully restrained.

Concerning the citric acid, Mr. Spiller says:—"Citric acid is added to A simply to prevent the precipitation of lime by the addition of caustic alkali to the ordinary water."

As regards the name of the hydroxylamine salt used, it may be noted that it may either be called hydrochlor*ate* or hydrochlor*ide*, this latter termination having recently been adopted in the journal of the Chemical Society to distinguish the salts which hydrogen acids form with ammonia and its derivatives.

NOTES FROM NEW YORK.

Death of Henry T. Anthony—The New Orleans Exhibition—Photograph Exhibits—An Improved Camera and Shutter.

The sudden death of Mr. H. T. Anthony, one of our oldest dealers in photographic goods and supplies in this country, was as unexpected as it was sad. It had been well known that for some time that he had been in ill-health, and had visited the hot springs in Arkansas, and other places, for the purpose of gaining strength and health. He had been benefitted by these trips, and on the day of the accident was especially bright and active at his office. On his return home from the office in the afternoon, he stopped at the Phœnix Club—of which he was a member—near Union Square, and from there started on his way home. On crossing Fourth Avenue to take a car, he was knocked down by a four-wheeled cab going at a high rate of speed, which ran over him, seriously bruising his head, breast, and thigh. He was picked up in an unconscious state, was carried to a neighbouring hospital and finally to his home, where, for a few minutes, he revived sufficiently to recognize a few friends. After that he relapsed into unconciousness, and died on Saturday morning, the 11th inst., surrounded by his relations and friends. At his funeral, which took place on the morning of the 14th inst., at his brother's house, there was a very full attendance, many old photographers and scientific gentlemen prominent in their various pursuits being among those present.

In the remarks made, his career, so far as it related to photography, and the part he took in advancing it, was strongly pointed out. In his place of business he was highly esteemed by all the employees, especially for his equitable dealing towards each one. To him amateurs owe much for his perseverance in manufacturing good chemicals for photographic work. He was always ready to impart information to amateurs, no matter how ignorant they were, and in the early days of photography he would go out of his way to help some troubled man beset with difficulty. He was seventy-one years old, and had been interested in photography with his brother Edward for forty-six years. It was his fortune to witness and engage in the wonderful photographic progress of our epoch, from the time when we had the slow Daguerrotype plate, to the lightning gelatine plate of the present day. At the last meeting of our Amateur Society, on the 14th inst., resolutions of respect to his memory were passed.

At the same meeting a vote was passed authorizing the Society to send a collective exhibit of photographs made by members to the great New Orleans World's Exposition to be held at New Orleans, La., between December 1st, 1884, and May 31st, 1885, and towards which Congress has appropriated $1,500,000. A committee on "Photography," of which Mr. E. L. Wilson, of the *Philadelphia Photographer*, is chairman, has been appointed, and it is probable that a very elaborate exhibit of everything in any way pertaining to photography will be made.

Several sub-committees have been appointed under the following heads:—

E. E. Wilson and S. T. Blessing, Committee on Practical Photography.

V. M. Wilcox, Committee on Photographic Apparatus and Requisites.

Charles Himes, Committee on Educational Photography and Literature.

F. C. Beach, Committee on Amateur Societies and Exhibits.

If each man succeeds in carrying out his department fully, it is likely to make the exhibit very interesting, and a source of pleasure to those visiting the exhibition. As it is to be a world's exhibition, locality is not important, and I learn that Mr. Beach is desirous of having representative exhibits from amateur associations in England and other countries.

A party of ten members of the Amateur Society made a very pleasant outing recently, on the 10th inst., to Llewellyn Park, Orange, N. J., at the invitation of O. D. Munn, of the *Scientific American*, and lunched with him at his residence.

A novel feature at the meeting on the 14th was the inauguration of the "Question Box," which elicited much discussion, and proved very useful in bringing out information of a practical character. It seems to be the endeavour of those who manage the Society to provide matters for practical discussion and demonstrations, rather than to have dry papers read.

A special committee on "gelatine plates" was appointed, whose duties were very clearly specified. They are to ascertain by experiment what are the best grades and brands of plates for the amateur's use. Mr. Beach stated that he had used the following intensifier with much success:—

No. 1.—Saturated solution bichloride mercury	1 ounce
Water	6 ounces
No. 2.—Water	1 ounce
Sulphite soda (crystals)	...120 grains

The plate is whitened a little in No. 1, then washed and immersed in No. 2. It turns a dark wine colour, and the shadows keep very clear.

Mr. C. R. Smith, the inventor, exhibited his mirror shutter and camera, patented July 1st, 1884, and described in one of the recent issues of the News. The shutter is inside of the box, between the lens and dry plate, and has a broad curved bottom with a slit in it to match the lens. In its normal position, the front towards the lens, with the mirror attached, is at an angle of 45°, and reflects the image upon the ground glass placed horizontally at the top above. A coiled flat clock-spring at the axis of rotation imparts the necessary movement, and it is wound up or loosened by an ordinary clock key from the outside. The operator sees the image plainly on the ground glass non-reversed, and when it has reached the position he desires, a spring catch is touched, which allows the coiled clock-spring to throw the front of the shutter up in a horizontal position, and brings the slit in the curved bottom in front of and past the rear of the lens, thus making an instantaneous exposure. The apparatus worked very smoothly and silently; in fact, it was noiseless, and there was not the least jar.

The inventor remarked that the partial vacuum created in the rear of the box by the sudden movement of the shutter acted as a cushion, and prevented jar. He showed specimen prints made from negatives by the shutter.

Another gentleman, Mr. Fish, showed a shutter which he claimed was an improvement on the well-known Prosch shutter. He used two springs, one a spiral, the other a flat, straight opening, one adjustable to the other, and had some new catches to regulate the tension and movement of the shutter.

Mr. Beach remarked that from his experience Mr. Fish's idea was correct, as the chief trouble with the Prosch shutter had been the liability of the flat coiled spring to break just at the time it was needed.

Some demonstrations were made with reference to the development of instantaneous plates, after which the meeting was adjourned.

A lantern exhibition is to be given on the 30th. The next regular meeting occurs on November 11.

The membership of the Society continues to increase rapidly, and the treasurer's report for the first six months showed a handsome surplus in the treasury.

At the November 11th meeting a demonstration of the platinotype process is to be given by Mr. Chas. A. Needham, of this city, who is doing good work for amateurs.

At the outing to Llewellyn Park, on the 10th inst., Mr. R. A. C. Smith carried with him an improved Hare camera, with extension back, and a perfect working changing-box, which he had recently imported. He did some splendid work.

Mr. J. B. Metcalf had a Bick camera, with folding slide

in the plate-holders for 3¼ by 4¼ plates, which was much admired for its high finish and compactness. He, also, is an expert amateur. THE NEW YORK AMATEUR.

October 18th.

PRESS NOTICES OF THE PHOTOGRAPHIC EXHIBITION.

[From the *Graphic*]

There is no startling novelty in this year's exhibition, but there is a distinct improvement shown in various directions. Firstly, photographers are better succeeding in their endeavours to make a picture complete in itself, instead of being satisfied with a mere reproduction of a portion of a scene. Such a photograph, deprived of the colour and surroundings of the original, may be excellent from a technical point of view, but will not in any way bear criticism if judged from an artistic standpoint. Now, as a brilliant exception to this, Messrs. Robinson and Thompson have sent a scene on the quays of Venice, "Venetian Boats," which is really an admirable picture in itself. Mr. H. P. Robinson also has sent some good figure studies in the open air, of which "He never told his love" has justly been awarded a medal. The boots of one of the young women, however, were a little too close to the lens, and look like banjo clogs. Mr. J. Gale also has some capital figure subjects, of which "At Rye—Oh, Fie!"—a flirtation between a fisherboy and and a girl at a cottage door—is much the best. Mr. Adam Diston, whose charming old woman spinning excited so much admiration last year, shows another industrious housewife blowing out the dust from a Dutch clock, while his Dutchlike style has been successfully followed by Mr. G. Hadley in his "Small Studies," which have duly carried off a medal. The same artist's "Business Slack," a more ambitious study of fisher life, is capital. In many other figure subjects, however, the figures still possess the stiffness of which we have before complained, and the models are manifestly uncomfortable in their unusual costumes. Indeed it is here, in such pictures, for instance, as Mr. Cotesworth's "Awkward Lead," that the painter has the advantage over the photographer, for, while the grouping is excellent, the former would have been able by a touch of his brush to soften the rigidity of the most iron-jointed model.

Of portraits proper, Mr. Valentine Blanchard shows some capital full-length figures in unconventional attitudes, of which "A Siesta" is exceptionally graceful, while those of Messrs. Lafayette and of H. S. Mendelssohn are particularly worthy of mention, the latter especially for the arrangement of the drapery. Of animal studies there are exceptionally few this year. Mr. Dixon, as usual to the fore, sends a Spanish Imperial eagle, while a splendid cat, an enlargement on porcelain, is sent by Mr. H. Pointer.

The second improvement to be noted is undoubtedly the reproduction of interiors, which, thanks to the improved lenses, or better plates, can now be clearly depicted. With a lively recollection of the difficulties in Italy of procuring any really good photographs of interiors of churches, we can award the most unhesitating praise to the really magnificent photograph, by A. G. Tagliaferro, of "The Interior of St. John's Church, Malta," in which all the abundant detail is faithfully reproduced. Nor is the improvemement any the less marked in many other interiors exhibited. And here we may express our surprise at the extreme paucity of architectural subjects, considering how far afield both amateur and professional photographers go now-a-days. There are also very few foreign subjects, but of these a melancholy interest attaches to the desert scenes in Algeria by the late Mr. Baden Pritchard, taken only a week or so before his death; while Mr. Stone sends some good reminiscences of a trip to the Canary Islands, notably "The Troglodyte Village of Atalaya, Gran Canaria," and Mr. Donkin shows some more of his studies in the High Alps. These, by the way, together with similar scenes by Mr. V. Sella, from a photographic point of view, are some of the finest things in the room. In the home landscapes, which form the majority of the photographs, there is good techical work, but little variety in artistic treatment. The School of Military Engineering send some good views of Lynmouth; Mr. Arthur H. Dyke-Ackland some good landscapes showing long distances—a difficult feat to achieve with a small camera; Mr. J. Stenning some capital views in North Wales and the Lakes; Mr. H. B. Berkeley an exquisite platinotype print of Pangbourne Lock; and Captain Abney several scenes on the Cherwell.

As usual, there is no lack of "breaking waves," though several show signs of the negatives having been over-carefully touched up. One of the best is by Mr. C. Grassin. The velvety appearance of the neck of the wave is exceedingly good. There are some capital yacht studies on the Solent by Messrs. G. West and Son, and one very singular view of a wreck, evidently taken from a height above, by Mr. W. Brooks. Of the curiosities of the Exhibition, we should mention photographs of a streak of lightning, by M. Auty; that of an express train, taken in 1-300th of a second, by Mr. C. Grassin; and some views from a balloon.

In addition to the photographs, there is a comprehensive display of apparatus, with some new instantaneous shutters, and some abnormally light cameras, especially welcome to amateurs.

TONING.

BY W. M. ASHMAN.*

As one of the many professionals who regularly practise the perfected researches of others—viz., those photo-chemical scientists, whose names have become as familiar to all students of the art as those of Galvani, Volta, or Faraday to the students of electrical science—it will be readily understood that I cannot say anything which is new. Premising this to be the case, I shall endeavour to show the *raison d'etre* of the various processes to be hereinafter described, and to whom we are indebted for their discovery.

I have already in the previous paper dealt with the means employed in preparing a suitable paper to receive a photographic image, including the methods of albumenizing, sensitizing, and fuming. Preserved papers were also spoken of, and many useful hints were gathered in the discussion which followed. As it will be necessary to refer to these papers in the remarks which are to follow, it will be found more convenient if we distinguish the preserved paper from freshly prepared by the cognomen of "preserved" and "ordinary."

Beginning with ordinary paper, printed under a negative somewhat deeper than it is desired to have the prints when finished, we should have a print which, although beautiful to look upon, possesses a charm of only a transient nature, due to the gradual decomposition that takes place when organic substances such as albumen are long in contact with free nitrate of silver; hence the necessity of the processes I have to describe.

In the case of alkaline toning with borax or acetate of soda, the first consideration is to free the paper as much as possible from the excess of silver nitrate remaining therein, over and above the quantity used in the production of the print; this is termed washing away the free silver. That operation is satisfactorily performed by soaking the prints in a few changes of clean soft water, usually four, or until the water is no longer opalescent when tested with a few grains of salt. The washing water so obtained is collected in the manner described to you by Mr. F. W. Hart, and precipitated with dilute hydrochloric acid. The vessel employed should be scrupulously clean, either earthenware, porcelain, or wood answering the purpose.

Experiment I.—The treatment of the prints is sometimes followed by passing them into a dilute solution of sodium acetate or ordinary common salt, about one per cent., such as here shown, and stirring them about for five minutes, when it will be seen they have assumed a brick-red colour, the object of which is three-fold. Firstly, the fibres become charged with a substance which acts as a chlorine absorbent, a necessary property to be mentioned further on. Secondly, a definite colour is ensured to start with, thus obviating the possibility of mistaking fresh prints in the toning bath for those which have become purple by reason of the deposited gold, an important consideration when dealing with fumed paper. Thirdly, the last trace of free nitrate of silver is removed, thereby preventing a too rapid decomposition of the toning bath.

Theoretically considered, it is proper that the last trace of silver nitrate should be removed; but those who are engaged in the daily practice of commercial work do not insist upon the strict observance of such a rule in all cases. An especial exception is permitted and advocated when dealing with prints from weak or under-exposed negatives, this class being found to yield richer tones by not washing any of the free silver out.

The plan of soaking prints in a solution of sodium acetate was originally recommended, in lieu of washing, by a member of this Society, Mr. A. L. Henderson, as long ago as 1861, the following being an outline of the method suggested by him:—

* Read before the London and Provincial Photographic Association.

Slightly over-printed proofs were soaked in a bath composed of—

Sodium acetate	240 grains
Water	10 ounces

The unwashed proofs were moved about in this solution at least ten minutes, in order to convert all the free silver nitrate into acetate of silver; after slight rinsing in clean water the proofs were toned with—

Gold terchloride	4 grains
Sodium acetate...	240 ,,
Water	10 ounces

Among the advantages claimed was an entire absence from mealiness, a defect, you will remember, we now avoid by the adoption of ammoniacal fuming.

Guide-books to the practice of printing usually recommend three rapid washings; the decomposing action thus set up by the quantity of free silver remaining in the paper materially quickens the speed of toning. To prevent a too rapid deposition of gold, some printers prefer adding a small quantity of common salt to the toning bath, which turns the prints sufficiently red, and acts in some respects equal to an intermediary bath.

Preserved papers, containing, as they generally do, a certain proportion of free acid, are liable to give some trouble in toning, owing to the retarding action of the acid present. When this occurs it is in a great measure overcome by the use of an intermediate bath of an alkaline character and sufficient strength to neutralize the acid. Either the carbonates of ammonia or soda are found useful for this purpose, and I cannot do better than quote the one mentioned by Mr. Frederick York, which, it will be remembered, is composed of—

Washing soda	1 ounce
Water	1 gallon

Prints treated in the manner described are ready for toning by the alkaline method to be dealt with later on.

This brings us to the consideration of toning baths generally. The properties of toning baths vary somewhat, according to the mode of preparation. The term toning, as we understand it, implies a certain change of colour, brought about by chemical means, such as the deposition of a stable metal upon one that is easily affected by the atmosphere—electrolysis, in fact.

Evidently Mr. W. H. Fox Talbot was the first to use the toning bath in connection with paper photography, although he does not seem to have made much headway with his process at first, for it is recorded that from January, 1839, the date when Mr. Talbot communicated his discovery to the Royal Society, until 1845, very little improvement took place. These early paper pictures, be it remembered, were designated photogenic drawings. Talbot-type was not patented for some time afterwards.

In the year 1845, however, it was found that steeping the paper in terchloride of gold, vastly improved the results. It was not until 1853 that albumen took any part in the production of prints, the honour of its introduction being ascribed to Mr. Henry Pollock, although it seems that M. Le Gray, of Paris, about that time was producing stereoscopic pictures on albumenized paper. To M. Le Gray is due the credit of introducing gold toning in lieu of sulphur. The first toning then was performed by the decomposition of hypo, and known as sulphur toning, by which fine black tones were obtained upon the addition of an acid—such as acetic, sulphuric, or other suitable oxidizing substance—to the hypo; gold taking no part in this process. Unfortunately, prints so treated are said to be the least permanent of any, but of that I can bring no actual proof, never having employed the process.

Experiment II.—Toning by Sulphur.—We have an unwashed silver print here in a 20 per cent. solution of hypo, and to that we now add a few drops of slightly dilute sulphuric acid. It will be seen that a straw-coloured substance is immediately liberated, which is sulphur in an exceedingly fine state of division, and this becomes attached to the print. Toning action goes on, through the silver image being tarnished, or, more correctly, converted into sulphide of silver. This liberation of sulphur may be expressed by the following equation:—

Hypo + Sulph. Acid = Glauber Salts + Water + Sulph. Di-oxide + Sulph.

$$Na_2S_2O_3 + H_2SO_4 = Na_2SO_4 + H_2O + SO_2 + S$$

With respect to the reaction which takes place when toning a silver image with sulphur, I will quote a few lines from the parent work of reference for nearly all recent writers, viz., "Hardwick's Photographic Chemistry," wherein we find the following paragraph:—

"It is well known that articles of silver plate become darkened by exposure to the fumes of sulphur, or to those of sulphuretted hydrogen, of which minute traces are always present in the atmosphere. If the stopper of a bottle of sulphuretted hydrogen water be removed, and a simply fixed photographic positive suspended over it, the picture will lose its characteristic red tone, and become nearly black. The black colour is even more intense than an experienced chemist would have anticipated, because analysis teaches us that the actual quantity of silver present in a photographic picture on paper is infinitesimally small; and it is well known that sulphide of silver, although of a deep brown colour, approaching to black when in mass, exhibits a pale yellow tint in thin layers, so that a mere film of silver converted into sulphide possesses very little depth of colour. To explain the difficulty, it has been suggested that the toning action of sulphur on a red print is probably due to the production of a sub-sulphide possessing an intense colorific power, like the sub-oxide and sub-chloride of silver. When the toned picture is subjected to the further action of sulphur, it is converted into the ordinary protosulphide of silver, and becomes yellow and faded."

The toning baths following the sulphur method were principally mixtures of gold terchloride and hypo. This latter substance was found to be a solvent of certain silver compounds by the Rev. J. B. Reade in 1839, Mr. Talbot having previously fixed his prints with common salt. Prints, too, were fixed first in some cases, and toned afterwards, washing away the free silver being more or less practised in the mixed hypo and gold, and the sulphur toning processes. When fixing was employed before toning, it was usual to soak washed prints in a 20 per cent. solution of hypo for a period of ten minutes, or until the soluble silver salts were removed, the resulting colour being a disagreeable yellowish-brown. To improve the result so obtained, the prints were passed into a solution of—

Gold terchloride	10 grains
Water	20 ounces

when toning action quickly followed, the yellow colour giving place to that of a dark sepia tint. From this stage to that of mixing these two substances together was only a natural sequence and effected a diminution of gold to the extent of one-fourth, as will be seen by the following recognised formula:—

Hypo	7 ounces
Water	20 ,,

When dissolved, add

Gold terchloride	5 grains
Dissolved in water	20 ounces

After mixing, a clear solution should result.

The sel d'or process followed, and was expected to give still better results. It was found, however, that the solutions would not keep, and as a considerable quantity of the gold salt was needed, it caused experimenters to search for a less expensive method. One decided point in its favour was the circumstance that prints suffered no loss of intensity during the operation, as they do in the case of all other toning methods; briefly, the prints were well washed to extract free silver, and after soaking five minutes in salt and water, they were passed into an alkaline solution composed of—

Liquid ammonia	60 minims
Water...	20 ounces

Here they became very red; after washing in clean water the surface was flooded with a toning solution composed of—

Double hyposulphite of gold and sodium

(sel d'or)	½ grain
Hypo	1 ,,
Water	1 ounce

Upon the print assuming a purple-grey colour, it was withdrawn and fixed in a 16 per cent. solution of hypo, to dissolve the unacted upon silver chloride. Gold when in a fine state of subdivision is of a rich purple colour; the layer obtained by deposition upon the silver image is very finely divided, hence the colour; and the only object in continuing toning action beyond the stage at which a good surface colour has been reached, is to obtain a deposit of sufficient density to completely neutralize the red colour of the organic silver image beneath; therefore it is preferable, in forming a judgment of toning action, to examine proofs by transmitted light rather than by reflected only.

Before dealing with the various formulæ for alkaline toning, I should like to step out of the golden track to say a few words on platinum tetra-chloride ($Pt.Cl_4$).

Experiment 3—*Platinum Toning.*—The value of a platinum salt as a toning agent for silver images has been thoroughly demonstrated before you by Mr. Henderson, when he initiated us into the secrets of ceramic photography. My trials with this salt as a toning agent for paper proofs have only been partially successful; by that I mean that toning does take place when a dilute solution is employed, but the action is too tardy for demonstration here to-night, since anything like a black tone could not be obtained under half-an-hour. You will observe that the surface becomes covered with chloride, showing the necessity for copious washing. Yellow or discoloured prints are bleached when toned in this bath, the whites becoming very pure. The formula here given is capable of producing a very good shade of brown in less time, and should be permanent, since platinum is a metal practically unaffected by the atmosphere; and I think there is good reason to suppose that if a thin coating of platinum could be deposited on the silver image, the protection offered would be more economical as well as stable. Something has already been done in this direction, but not in recent years.

The following is the composition we are now using:—

Platinum tetrachloride, syrupy solution, colour of Old East India sherry ...	5 minims
Hydrochloric acid	150 „
Water	20 ounces

Wash away the free silver thoroughly; warm the toning solution to 70° F. Fix in a 20 per cent. hypo bath.

Mr. A. Watt, in the second volume of the Photographic News, gives a formula which runs as follows:—

Solution of platinum...	30 minims
Hypo	3 grains
Hydrochloric acid	5 minims
Water	5 ounces

This bath is said to act instantly, but I have not had an opportunity to test it. The strength of the platinum solution here given is indefinite, but any of our experimental members can soon ascertain the amount of dilution necessary to obtain the most favourable results.

Alkaline Toning.—Owing to the bleaching action which occurs in toning silver prints with gold, which is slightly acid, certain experiments were made, and it was found that bleaching increased in proportion to the quantity of hydrochloric acid added. Now in the action of toning, chlorine is disengaged, and in order to render this powerful bleaching agent inert, it has been proposed to introduce a substance capable of combining with it, and thus, in absorbing it, prevent undue loss of vigour. To obtain this a slightly alkaline toning bath became a necessity, and to Mr. Waterhouse we are indebted for the introduction of the alkaline salts (Hardwich). Here is an example:—

Experiment 4.—Sodium carb. (Na_2 H. Co_3) ...	5 grains
Auric terchloride ($Au Cl_3$)	1 „
Water	10 ounces

Instead of the dry bicarbonate, we will use a saturated solution. In this, as well as the following experiments, we shall tone three prints of the same subject—viz., ordinary ditto fumed and preserved.

Mr. Maxwell Lyte has written on and investigated the properties of toning solutions a great deal more than most men, and in Vol. I., Photographic News, we find the following emanating from Mr. Lyte—

Sesquichloride of gold	15 grains
Phosphate of soda	300 „
Distilled water	1¾ pints

And in the same communication it is mentioned that 180 grs. of borax may be substituted for the phosphate with a like result; therefore it will be seen that a borax toning bath is not of recent discovery, although it does not appear to have been quoted in many formulæ for at least a dozen years after its publication.

After the publication of Mr. Lyte's formulæ it was found that other salts behaved similarly, and among the first suggested we find sodium acetate, the qualities of which, extolled by the introducer, Mr. Hannaford, have since been verified by the whole photographic world. Here is one of the ordinary formulæ—

Experiment 5.—Gold terchloride	1 grain
Sodium acetate	10 grains
„ chloride	10 „
Hot water	20 ounces

Mix twenty-four hours before use. Neutralize with chalk or whitening (carbonate of lime).

The name of M. Le Gray must be mentioned as the originator of the lime and gold toning bath; although the original formula differs somewhat from the one now used, the results are identical. The original formula consisted firstly in washing away a portion of the free silver, by soaking the proofs for a few minutes in two changes of water, then submitting them to the action of an auriferous bath, composed of—

Terchloride of gold, 1 per cent. solution ...	1 part
Hypochloride of lime (white powder) ...	3 parts
Distilled water	1000 „

The action was complete in ten to fifteen minutes, when the prints required washing in two changes of water to free them from the chloride of lime remaining in the fibres previous to fixing in 1 to 6 hypo. If the tone was satisfactory at the expiration of fifteen minutes, the ordinary washing could be proceeded with; if not, the proofs were submitted to a final bath composed of—

Gold terchloride	2 parts
Hypo	200 „
Distilled water	1,200 „

M. le Gray says, "The proof ought not to be left in this bath less than fifteen minutes, as that is the minimum time necessary to insure the permanency of the picture; but it may be allowed to remain in it for as much longer as is requisite for obtaining the desired tone." Efficient washing in warm and cold waters completed the operation. Should any of our provincial members experience a difficulty in obtaining calcium chloride for their experiments, it can be easily made by causing dilute 1—3 hydrochloric acid to re-act on common whitening, and when neutral filter, and set aside for the crystals to separate out.

Experiment 6.—The uranium and gold toning bath has many friends. The tones are said to be richer and to economise gold, whilst it is very easy to work. I am unable to give the author's name, but I can give a formula which has worked well in my hands. After washing away the free silver, tone in the following mixture—

No. 1.—1 grain acid solution of gold terchloride	1 ounce
Water	7 ounces

Neutralize with sufficient of a 20 per cent. solution of sodium carb. (Na_2 H. Co_3).

No. 2.—3 grain solution of uranium nitrate	1 ounce
Water	7 ounces

Neutralize as in No. 1. Warm each to 70° F., mix. The bath is then ready for use; it can be used repeatedly if desired by acidifying with citric acid and neutralizing before use, but nothing is gained by using it a second time.

There are methods of toning which resemble more or less those which have occupied our attention to-night; among them may be mentioned the tungstate bath, likewise citrate of soda. The vermilion bath, too, might afford sufficient matter alone for a lecturette. If some one experienced with it could be induced to bring it before us, I am sure it would prove interesting.

My experience with toning is so limited, that I find I have become exhausted, so (*nem diss*) must conclude; but before doing so allow me to express a desire that one of our able members will, when opportunity occurs, gather up my disjointed remarks, and shape them into a paper, which may also include the processes I have omitted.

Notes.

Photography in its more scientific aspect will, we are glad to learn, be represented at the Society of Arts during the coming session; Captain Abney having consented to give another course of Cantor Lectures. The special branch to be treated of is the bearing of photography on work with the spectroscope.

"That which would infringe the patent if later, anticipates if earlier," is the excellent ruling of Mr. Justice

Sage, in a United States superior court. There have been many decisions in this country by no means in accord with this principle; indeed, it is interesting to note that there are but few photographic patents in this country which have not been anticipated, so great is the inclination of photographic experimentalists to publish their results at once.

Particulars as to the sad death of Mr. H. T. Anthony, of New York, will be found in the letter of our New York correspondent. His loss is much felt among his friends.

While volumes have been written about the masters of the Italian, Flemish, and German Schools of painters, and no end of engravings in every style have been published of their works, nothing has been done to familiarise the public with the English school. This reproach will shortly be removed, as Messrs. Goupil have now in preparation about eighty reproductions in photo-gravure of the masterpieces of deceased British artists in the National Gallery, about forty from the South Kensington Museum, and others from the National Portrait Gallery. Professor Sidney Colvin, and Messrs. T. H. Ward and Stopford Brooke, will supply the explanatory text.

Among the useful applications of the phototype or chemigraphic process of block making may be mentioned the production of new editions of old books, but it may also be used with advantage for making enlarged or reduced copies of current works, especially when special difficulties would attend the re-setting of the type.

Hymn books in which music and words are printed side by side are always required in several sizes, and we are interested to see that the reduction of the small copy of the new Methodist Hymn and Tune Book intended for congregational use is a phototypic reduction of the large edition intended for the use of organists. The work has been done by Messrs. Novello, Ewer, and Co., and is a good example of one of the modern commercial uses of photography. It may be mentioned that the expense of setting up the small edition in type would have been much greater than that of phototyping, as music type is by no means so easy to set up as ordinary work. Full working details of the chemigraphic process appeared in a series of articles commencing on page 673 of our volume for 1882.

Some years ago we pointed out that a full-sized sheet of music is quite legible if reduced to the size of a carte or cabinet by the aid of photography, and it is probable that if some music publisher were to issue his music in this size, there would be a good sale for it. Those who hesitate to take out the obtrusively obvious roll of music on the chance of being asked to sing or play, would be able to carry the more convenient cartes or cabinets in the pocket without making any show of expecting to be asked.

The appearance of a new catalogue of the National Portrait Gallery suggests a question that must have occurred to more than one visitor to this very interesting collection. Why should not the Gallery contain photographic portraits of modern English celebrities? It perhaps may be said that the collection would be swamped by a rush of mediocrities, but this need not be the case if proper supervision be exercised. Admission for entrance might be confined to deceased men and women of note, so as to prevent the introduction of ephemeral notoriety.

The superb yachting pictures of Messrs. West in the Exhibition are exciting much controversy, some keen and practical examiners contending that they are enlargements, very beautifully executed, but enlargements for all that. The absolute sharpness of one particular yacht, the masthead in which reaches nearly to the top of the frame, while the hull is not far from the bottom, is cited as an argument against the possibility of vessels proceeding at a high rate of speed being photographed of so large a size.

The forthcoming New Orleans Exhibition will, it is said, be able to boast of having the largest photographs in the world. They consist of views of the public buildings in Washington, and are five feet wide by seven feet long. They have been taken by order of the Government. It is unnecessary to add that the pictures are from a combination of negatives and a combination of prints after the fashion of the gigantic picture from Berlin, exhibited some years ago at the Photographic Exhibition. If we remember rightly, the Berlin photograph was even larger than these American ones.

The paper bottles now made in Paris are built up out of sheets of paper somewhat after the fashion of rocket cases, but the cementing material is a mixture of blood-albumen, lime, and alum. Neither water, wine, nor alcohol has any action on such bottles, and it is expected that they will prove of great value to travellers, as there is but little fear of breakage.

Professor Langley continues in this month's *Century* his interesting papers on "Celestial Physics; or the New Astronomy." He deals in the present paper with solar eclipses, and especially with total eclipses, to see which, he remarks, it is worth going a journey round the world. In 1869 the camera was first used, and proved a manifest advantage, for, as Professor Langley remarks, although the camera could see far less of the corona than the man, it has no nerves, and what it sets down we may rely on. Mr. Ranyard's photographs of the 1871 eclipse are declared by Professor Langley to be the best ever taken. The value of photography in solar eclipses is self-evident when, as Professor Langley remarks, it is considered that, although total eclipses come about every other year, yet they continue (in regard to duration of totality), one with another, hardly three minutes; and an astronomer who should devote thirty years exclusively to the subject, never missing an eclipse in whatever quarter of the globe it occurred, would, in that time, have secured in all some-

thing like three-quarters of an hour only for observation!

After more delay than was expected, the new (sixth) edition of Captain Abney's "Instruction" is published; the delay being a necessary consequence of the author's resolve to considerably enlarge the work, and bring it thoroughly up to date.

We also receive the eighth edition of Dr. Liesegang's well-known and excellent "*Handbuch des practischen Photographen*," and shall say more about both these books next week.

A building to which the Society for photographing interesting portions of the metropolis should turn its attention is the Paymaster-General's Office in Whitehall, which is to be pulled down in the course of the next twelve months. Architecturally speaking, the Office is of no interest, and its interior, though old and intricate, possesses no particular attractions in the shape of carving or fittings: but the political associations of the building are many and most interesting. It used to be the residence of the Paymaster of the Forces at a time when that post was one of the most lucrative in the gift of the Crown, and Henry Fox (afterwards Lord Holland) lived there for many years. Especially should the large room now known as "No. 5," and devoted to the payment of naval pensions, be photographed. This was the dining-room of the old Paymaster, and if walls could speak they could tell us of many a protracted carouse which rarely finished while any guest was above the table. But it has more reputable associations as well. Pitt has often dined there; and, coming down to later years, Lord Macaulay, as Paymaster-General, also used it for a dining-room.

A photograph, too, should be taken of the small, otherwise ordinary looking room, on the first floor, in the chimney of which, tradition asserts, the spirit of Oliver Cromwell finds asylum.

Gossip has it that if by any chance the room in question is profaned by an oath, the Puritanic Lord Protector's ghost gives audible proof of its presence by three distinct raps! It is too much, we fear, to ask the Society to obtain a cabinet—or a dark cabinet, shall we say?—of Oliver's shade, which, by the way, will probably claim compensation of some sort for disturbance when its flue is rattled about its ears, if, indeed, shades have any. It will be necessary, by-the-bye, for psychologists to note if Oliver's spirit takes up its abode in one of the brand new chimneys of the new structure.

Why should the photograph of a Hanson cab—which is always to be seen in the windows of most of the Strand photographic print dealers—occupy such a prominent place? The Hanson is an ordinary Hanson, the driver has nothing about him different from other cab drivers, and the steed is a fair sample of the London cab horse. The reason is, that this particular picture is an especial favourite with American buyers. There are no Hanson cabs in New York, and hence the photograph of the London gondola is bought as representing something essentially typical of London life.

No wonder Miss Anderson favours photography. Apart from the splendid advertisements it has furnished her, it was the means of giving her an introduction to the aristocratic sculptor, Count Gleichen. The count was one evening dining with the Prince and Princess of Wales, and after dinner the Princess produced a number of photographs of a young lady, remarking that the subject would be an admirable one for a sculptor. The photographs were those of Miss Anderson, whom Count Gleichen had never seen before, and he asked if he might tell Miss Anderson that the Princess would be pleased if he executed a bust of her. The Princess answered in the affirmative and the bust in due time was chiselled.

Patent Intelligence.

Applications for Letters Patent.

13,906. John Veda Robinson, 39, Lower Sackville Street, Dublin, for "Improvements on his photographic camera."—Dated 21st October, 1884.

14,122. John Joly, 43, Pembroke Road, Dublin, for "The measurement and estimation of the amount of light emitted from a luminous body."—Dated 25th October, 1884.

14,156. George Percival Smith, Beechholm, Tunbridge Wells, for "Improvements in photographic apparatus."—Dated 25th October, 1884.

Patents Granted in America.

306,635. Charles A. Needham, New York, N.Y., assignor to E. P. Needham and Son, same place. "Clamp for manipulating photographic plates." Filed April 10, 1884. (No model).

Claim.—A device for manipulating a photographic plate, consisting of an approximately-straight portion, B, a portion *b*, near one end of said straight portion, extending transversely thereto, and a portion, *a*, extending from said straight portion downward toward the portion *b*, so as to nearly meet the same, and forming therewith a narrow opening through which a photographic plate may be slid sidewise or edgewise, the side edges of the device being in approximately the same plane, substantially as specified.

306,636. Charles A. Needham, New York, N. Y., assignor to E. P. Needham and Son, same place. "Photographic printing frame." Filed April 14, 1884. (No model).

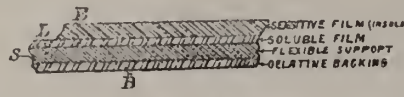
Claim.—The combination, with the back of a printing frame, made of two sections, and having a hinge connection at one side, of a covering applied to each of said sections, and turned over the meeting edges of said sections, and secured thereto by glue or other adhesive material.

306,470. George Eastman and William H. Walker, Rochester, N. Y., assignors to the Eastman Dry-Plate Company, same plate, for "Photographic film." Filed May 10th, 1884. (No model).

Claim.—1. As a new article of manufacture, the herein-described sensitive photographic film, consisting of a suitable flexible support coated on one side with a layer of gelatine, and on the other side with a layer of sensitive gelatino-argentic emulsion attached to the support by an interposed layer of relatively more soluble gelatine, substantially as described.

2. As an improvement in the art of photography, the herein-described process of making sensitive flexible photographic films,

consisting in coating a suitable flexible support on the reverse side with a solution of gelatine, in drying the said coating, in applying to the face side a coating of soluble gelatine, in drying the said coating, and in subsequently applying thereto a coating



of gelatino argentic emulsion of relative insolubility, and in drying the same, substantially as described.

3. As an improvement in the art of photography, the herein-described process of making sensitive flexible photographic films, consisting in coating a suitable flexible support on the reverse side with a solution of gelatine, in drying the said coating, in applying to the face side a coating of soluble gelatine, in drying the said coating, in calendering the coated support, and in subsequently applying to the face side of the coated and calendered support a coating of gelatino-argentic emulsion of relative insolubility, substantially as described.

4. The combination, with the flexible support S, of the gelatine backing B, and the layer of relatively-iusoluble gelatino-argentic emulsion E, attached to the support by the layer of more soluble calendered gelatine L, substantially as described.

5. The flexible support S, provided on one side with the insoluble gelatine backing B, and on the other with the soluble gelatine layer L, substantially as described.

6. The flexible support provided with a layer of soluble calendered gelatine, and having a coating of relatively-insoluble gelatino-argentic emulsion applied thereto, substantially as described.

7. The combination, with a flexible support, S, for a layer of sensitive gelatino-argentic emulsion, of the backing B, consisting of gelatine treated with chrome-alum or other chemical, and glycerine, substantially as and for the purposes set forth.

8. As a support for the film of sensitive gelatino-argentic emulsion, a flexible sheet coated with a layer of soluble translucent gelatine, and calendered on the coated surface, substantially as described.

9. As an improvement in the art of preparing sensitive photographic films, the process consisting in applying to a sheet of paper or like support a layer of soluble gelatine, and drying the same, then calendering the sheet to harden and polish its surface, and finally applying to the soluble layer of the calendered sheet a coating of relatively-insoluble gelatino-argentic emulsion.

306,594. George Eastman, Rochester, N. Y., assiguor to the Eastman Dry Plate Company, same place, "Photographic film."—Filed March 7, 1884. (No model.)

Claim.—1. As a new article of manufacture, a sensitive photographic film consisting of a coating of insoluble sensitized gelatine, a paper or equivalent support, and an interposed coating of soluble gelatine.

2. In a photographic film, the combination of the support A, the insoluble sensitive gelatino-argentic-emulsion film C, and the soluble interposed gelatine layer B, substantially as described.

3. In a film for photographic purposes, the combination of a backing sheet or support of paper or like material, a film of sensitized gelatine adapted to withstand the solvent action of water, and an intermediate film of soluble gelatine.

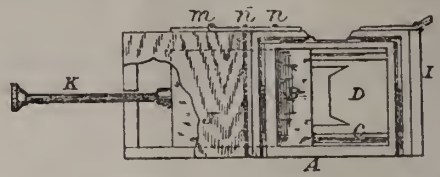
4. The herein-described sensitive flexible photographic film, consisting of the support A, having a layer of insoluble sensitized gelatine C, attached thereto by means of an interposed soluble gelatine substratum, said film being rendered flexible by means of glycerine, substantially as described.

5. As an improvement in the art of photography, the process consisting in, first, providing an insoluble sensitive gelatine film affixed by solvent material to a supporting-sheet; second, in exposing and developing said film; third, attaching the developed film to a rigid plate by means of wax or its equivalent; fourth, in detaching the support from the film by the application of heat; and, fifth, stripping the film from the waxed surface.

6. As a new article of manufacture, a sensitive photographic film composed of a paper or equivalent support, an insoluble sensitized film, and an intermediate soluble attaching film insoluble in the developing fluids, and at normal temperatures, but rendered soluble by the application of heat in watery solutions, substantially as described.

7. As a new article of manufacture, a sensitive photographic film composed, essentially, of a paper or equivalent support, a film of sensitized gelatine, and an interposed attaching film, the said sensitized film being insoluble, and the said intermediate attaching film being insoluble with respect to the developing fluids, but rendered soluble in water by the application of heat, substantially as described.

306,618. George W. Hough, Chicago, Ill., "Photographer's dry-plate holder."* Filed December 17, 1883. (No model.)



Claim.—1. As an article of manufacture, the holding-case B provided with the plate-holder C, and the cross-head G, as and for the purpose shown.

2. The auxiliary case J, in combination with an exposing case, for the purpose of affording a dark chamber for the case B to be drawn into, as and for the purpose shown.

3. The rod K, in combination with the auxiliary case J and the holding-case B, for the purpose of drawing the holding-case B into the auxiliary case J, substantially as shown.

4. The plate-holder C and spring D, both made from one and the same piece, as and for the purpose shown.

5. The exposing-case, with the light-excluding door I, at one end, and auxiliary case J at the other end, as and for the purpose shown.

6. The combination of the auxiliary case J, exposing-case A, holding-case B, and rod K, whereby the holding-case B, holding the plate, can be withdrawn from the exposing-case without exposing the dry-plate to the light, substantially as and for the purpose shown.

FRENCH CORRESPONDENCE.

Ceramic Exhibiton—Angerer and Goeschl's Phototypes—Development of the Graphic Method—Instantaneous Photography.

Ceramic Exhibition at the Palais de l'Industrie.—In this fine exhibition, organised by the Central Union of the Decorative Arts at the *Palais de l'Industrie*, I expected to find a good show of specimens showing commercial applications of photography in the decoration of china and earthenware, but as yet I have not discovered anything of a satisfactory nature. Perhaps, after a closer inspection of the various processes of decoration adopted, I may light upon that of photography. It is surprising to find how long it takes us to progress beyond the limits of our routine. However, I have be initiating a certain number of artisans, principally at Limoges, in the practice of decoration by photographic processes, whereby the accuracy and truth of the design are faithfully rendered. The processes themselves are now so improved that with a drawing on a particular kind of paper, a typographic block is made directly without further complication. Of course, these processes will have their day, but it seems a long time coming. As another example of our force of habit, may be cited the catalogue of the exhibition. It is illustrated with wood-cuts taken from photographs of the objects exhibited. With photographic negatives at one's disposal, would it not have been better, with the view of obtaining more exact and authenticated results, to have had them directly changed into typographic negatives by one of those processes so successfullly practised by Ives of Philadelphia, Meisenbach of Munich, or Angerer and Goschl of Vienna? The work thus produced would have been much more valuable than these wood-cuts can

* This apparatus appears to be similar to or identical with an arrangement previously patented in England.

possibly make it. Being absent from Paris at the time the catalogue was compiled, I was unable to take any steps towards having it illustrated in a more accurate as well as more useful way.

Angerer and Goschl's Phototypes.—While on the subject, I must say a few words on the beautiful prints issued by Angerer and Göschl, of Vienna. Until lately this firm has produced by mechanical engraving admirable typographic blocks, but direct typographic reproduction from photographs from nature had not been undertaken. The specimens which have been shown to me prove that in this line no others excel them. I am glad to notice this important fact, because it gives one the hope of a wide-spread use of this mode of photo-engraving for illustrating books and journals. The great difficulty still to be overcome is the facility of printing with the text, but it only needs more experience on the part of the printer, and proper apparatus for work of a different nature to that which is already in use.

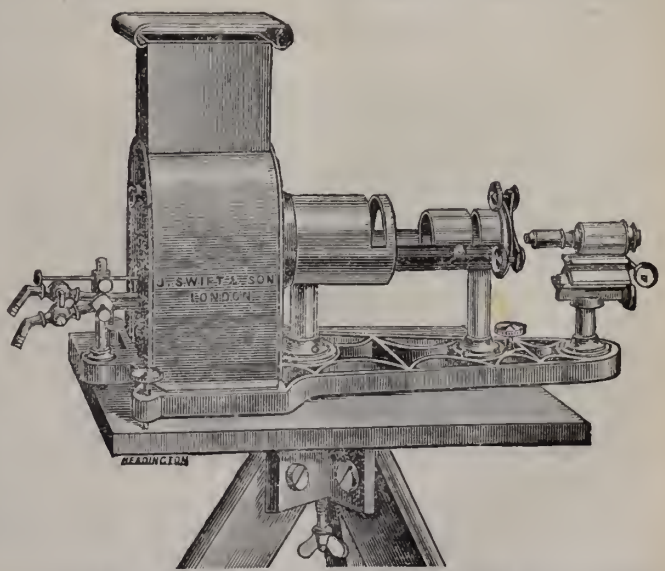
M. Marey's Book.—M. Marey, of the Institute of France, has, in his work entitled *Developpement de la Methode Graphique par l'emploie de la Photographie*, summed up the researches of several experimentalists and himself on the application of photography to the instantaneous reproduction of the movements of men and animals. The pamphlet is very interesting, and is only, to my mind, one stake planted in the track of the numerous applications promised to both science and art by instantaneous photography. M. Marey is pursuing his remarkable work, and we await new and interesting communications from him.

Instantaneous Photography.—I have devoted a considerable part of my long stay in the South of France on the shores of the Mediterranean to new experiments on instantaneous photography, and have had more than ever reason to insist upon the necessity of using a shutter giving exposures of known duration. It is useless trusting to chance. The first thing to be known is that the nearer the object or person in movement, the shorter should be the exposure; and yet most amateurs use the same, especially those employing a drop-shutter. I use a circular one made by Francais, fixed in the place of the diaphragms, and not troublesome in either weight or bulk, while the length of exposure is regulated by a spring. LEON VIDAL.

SWIFT AND SON'S OXYHYDROGEN MICROSCOPE.*

THIS apparatus is suitable for use with ordinary objectives from 4 in. to $\frac{1}{4}$ in. The gas jet can be regulated for either parallel or convergent light without the necessity of opening the lantern, it being mounted on an independent pillar 2 in. from the back, and fitted to adjust to or from the condensing lenses as occasion may require. The perforated metal base renders it very light, and also allows the passage of free current of air, so that the lantern is kept as cool as possible. There are three screws, upon which the whole is supported, to finally adjust the disc of light. The tube into which the convergent lenses, polariscope, and spot-lens fit is cut open for the purpose of easily dropping these pieces into position. This opening is covered with a revolving segment of tube, similar to the breach action of the Martini rifle.

The stage has rectangular motions by cams which are moved by the milled heads at the back of the stage, and the clip holding the object will equally clamp the thinnest slide or a thick zoophyte trough; the clip is lifted by turning the milled head. The coarse focussing is by rack and pinion, and the fine adjustment is similar in construction to that of the ordinary Hartnack microscope. The alum trough for stopping the heat rays can be used behind the condensers for convergent rays, or inserted in the opening in front when parallel light is required, the opening being covered by a revolving segment of tube when not used.



* *Journal of the Royal Microscopic Society.*

PHOTOGRAPHY AT THE SOUTH AFRICAN INDUSTRIAL EXHIBITION.

ON the 9th ult. opened the first great exhibition at Cape Town, and the following account of the photographic department is abstracted from the *Cape Times*.

In the photographic section of the Exhibition we find a collection of photographs which could be well compared with those taken anywhere else in the world. Those of O. Battenhausen, of the Vienna Photographic Studio, Port Elizabeth, are confined to portraits which are seen to advantage in a very handsome stand of colonial make, and of colonial woods. The centre portrait is that of a charming young lady in fancy costume, after the well-known picture of the Duchess of Devonshire, painted by Gainsborough. Mr. Harris contributes photographs of natives, and some magnificent views of the Valley of Desolation, in the district of Graaf-Reinet; of Algoa Bay; of sights seen on the voyage between England and the Cape; of places in the East frequented by sportsmen with gun and rod; extensive panorama of Port Elizabeth, and several large portraits. The Valley of Desolation, probably so-called because of the absence of verdure—for the photographs represent a region of stone and stunted bush—enables the photographer to picture towering masses of rock-work, which come out sharply distinct against a cloudless sky. Amongst the strange shapes which the rocks have taken there are column-like summits, in the crevices of which lurk deep shadows, bringing out in bold relief those portions on which the glare of the sunshine can positively be seen. Doré, when he was illustrating Dante's "Inferno," would have been deeply indebted to Mr. Harris for a set of these photographs of the Valley of Desolation, for they would have afforded some suggestions for the wild and the weird in the painting and imagining of which the great French artist was so consummate a master.

The view of the pier-head of the Port Elizabeth jetty is almost submerged in surf, and beyond the jetty the tugs tossing and pitching as they travel between ship and shore indicate the class of tug employed, and the skill of the sailors in charge of them. It is not necessary to say that Barnard, of Cape Town, holds his own in comparison with others. He exhibits some beautiful pictures of Cape flowers, exquisitely coloured, midget and other portraits. All the photographs of Mr. Barnard, and of other Cape Town photographers, demonstrate that the suburbs of Cape Town, for grandeur and beauty, are as unsurpassed by other parts of South Africa, as the Cape Town photographers are by their brother artists in the other towns of the colony. Mr. E. H. Allis, of Rosebank, has a most interesting set of views. That of Cape Town from the signal hill is one of the best photographic panoramas printed of the metropolis of South Africa. In the foreground is the dense bush which is found on some of the slopes of the hill. The town, with its regular blocks of buildings and straight lines of streets, would look like a chess-board if half of the blocks were painted black. The background is Table

Mountain and the Devil's Peak, and no mountain range is to be found amongst all the photographs in the Exhibition of greater grandeur.

Mr. Herman, whose oil paintings of Cape scenery have been so much admired, selects with an artistic eye the scenes which he has photographed with great skill. There is a fine panorama of Cape Town, of the breakers off Sea Point, of avenues at and near Rondebosch, of Mitchell's Pass and Bain's Kloof, of Camp's Bay, and of Cape Point Lighthouse, with the Cape of Good Hope. We are glad to see that the photographs of colonial scenery contains one of the once dreaded Cape of Storms, and Mr. Herman has been very successful. The bold headland on which the lighthouse is perched, the precipitous cliff, at the foot of which is a sandy shore, the lines of breakers, and the grandeur of the whole view, are faithfully reproduced.

There are photographs illustrative of the principal bridges constructed, or in course of construction, in the Orange Free State. They are of interest as indicating what the State is doing in the way of public works. Very singularly, with these bridge photographs is a group consisting of the late Right Hon. Sir Bartle Frere, Lady Frere, two of the Misses Frere, with the Hon. Will Littleton and Major Hallam Parr.

A NEW SENSITIVE COMPOUND.

Dr. R. B. West, of Guilford, Connecticut, writes thus to *Anthony's Bulletin*:—"Among the substances said to be sensitive to the action of light, I have never seen mentioned the so-called diazo compounds, some of which are changed by the actinic rays almost as rapidly as the chloride of silver; for example, diazo salicylic acid. This substance can be formed by dissolving salicylic acid in strong nitric acid, the vessel being kept cool by immersion in ice water. This nitro-salicylic acid has now to be reduced to amido-salicylic acid by boiling it with an appropriate reducing agent, say zinc dust and dilute sulphuric acid, the mixture first becoming brown and then colourless. It can be separated from the zinc sulphate by evaporation—solution in alcohol—which dissolves only the amido-salicylic acid sulphate, and final evaporation of the alcohol. The amido-salicylic acid sulphate—the acid being a base as well as an acid—becomes changed to diazo-salicylic acid sulphate, by saturating its aqueous solution with nitrogen-trioxide gas, evolved by the action of dilute nitric acid on starch or arsenious acid. Paper, silk, or other fabrics floated on a solution of diazo-salicylic acid or one of its salts, dried, printed, and washed in water, shows an image of a beautiful crimson colour.

Correspondence.

THE ROYAL ARMS CASE.

Sir,—Allow me to point out a few of the numerous inconsisteucies and misconceptions contained in the letter of Mr. H. T. Methven, published in your last.

The use of the Royal Arms is so general that in reality it has become to mean nothing more than that the person using it, or imprinting it upon his goods, wishes to signify that on one occasion at least he has been patronized by some member of the Royal Family of England; and those who see a deeper signification than this, view the symbol with the eyes of prejudice. Who, indeed, can suppose that the pickle manufacturer, the blacking maker, or the shoe-black, who uses the "Arms," does so with the "purpose of obtaining patronage by false pretences?" Personally, I can only look upon the free use of the "Arms" as an indication of a loyal feeling in this country, and a very cheap way of advertising royalty; but this is only an opinion. Now for matters of fact.

The firm prosecuted were actually and really photographers to the Queen personally, and also to various members of the Royal Family; but if they had held a formal warrant of appointment, they would have been in no better position as regards the law, as such a warrant does not in any way confer the privilege of using the Arms; moreover, Messrs. A. and G. Taylor were not prosecuted, as your correspondent appears to think, for representing themselves to be photographers to the Queen.

Mr. Methven seems to think that the Royal Family prefers to patronise "the smallest photographers"—a phrase a trifle vague; but one may suppose he means those doing a small amount of business. If this is his meaning, the case in point is a notable exception, as Messrs. Taylor have certainly one of the most extensive photographic businesses in the country, and one which gives employment to a host of workers.

According to the strict wording of the Act, the nature of the authority required to use the Royal Arms is a permission from some member of the Royal Family; but it is my conviction that no photographer at present holds such a permission. Still, those who are photographers to the Queen are likely to so style themselves as long as any loyal feeling (or snobbish feeling, as Mr. Methven would perhaps put it) exists in the public mind.

In conclusion, may I call attention to the following, which appeared in the *Solicitor's Journal* in reference to the carelessly worded and strange 106th Section of the New Patent Act?

"It appears to us that the harassing of tradesmen who cannot produce an authority for using the royal arms is unjustifiable, for no one is, or could reasonably be, deceived by such use into believing that a shop-keeper 'carries on his business by or under the authority of Her Majesty, or any of the Royal Family, or any Government department.' Everyone knows that the use of the royal arms by a shop-keeper means nothing at all. The real object of the enactment was supposed to be to prevent patent agents from using the royal arms on their offices and paper, so as to lead people to believe that their advice was given with the authority of a Government department; and if employed for this purpose only, the provision might have been valuable. But to attempt to extend its application to cases in which it is of no importance to any one, whether the arms are used or not, is absurd."

R. B. Halcombe.

[Our correspondent does not seem to be aware that the above quotation from the *Solicitor's Journal* has already been reprinted in the Photographic News.—Ed. P.N.]

Sir,—It is pretty generally known that soon after the New Patent Act came into operation, some business houses using the Arms were served with a caution from the Lord Chamberlain's department not to continue to do so; but many firms of this town replied to the effect that labels and price lists bearing the Arms had been registered by them in Government Departments, and fees accepted, and they were quite satisfied to rely upon this as a sufficient authority. No proceedings were taken against them. The recent action of a rival in trade against a large firm of photographers to the Queen is so mean and contemptible as to need no comment.

Redditch.

Sir,—A correspondent in your last has very properly denounced the misleading use that is made by some photographers of the Royal Arms. I can add an illustration of the very mild pretext on which they are, at times, assumed. Not very long ago, a photographer at a sea side place, which it is not necessary to indicate precisely, with an eye to future profit, as well as to vary the monotony of an off season, determined on taking a set of local views. Amongst the subjects selected was a pretty and picturesque cottage. A friend to whom the negatives were shown, exclaimed, "Why, that is where our Queen lived when she was Princess Victoria!" Here was a grand opportunity too good to be lost by so enterprising a photographer. A copy was at once forwarded to Windsor, and duly acknowledged in the usual formal manner by the official whose duty it was to attend to such things. The little local paper, of course, had its little puffing paragraph on "Our talented fellow townsman," &c., and as speedily as the necessary preparations could be completed, the Royal Arms were proudly affixed to the front of the ambitious photographer's place of business, and he called himself photographer to the Queen ever after.

J. R. Jones.

THE POTASH DEVELOPER.

Dear Sir,—Whatever Captain Abney may say concerning photographic matters must be received with the greatest respect and consideration; but judging from his words, I should imagine he speaks of Beach's developer more from theory than from any actual experience of its merits. I do not profess to be an expert in landscape, but last summer I experimented largely with the pyro-potash developer, and found it quite equal to anything in the way of instantaneous work, and far superior to the ordinary pyro and ammonia. The plates used were chiefly Swan's "10 times collodion," and they developed well and quickly, with abundant density. Nothing was needed to "start" the development, for it commenced in most cases as soon as the developer had fairly covered the plates.

Of microscopic photography I do profess to know something, and if Captain Abney has ever tried to develop with ammoniacal pyro a plate exposed with a $\frac{1}{12}$ in. or $\frac{1}{16}$ in. to a common paraffin lamp, he will know how difficult it is at times to start the development, and, when started, how still more difficult to get sufficient density. Using the potash developer, these difficulties almost entirely disappear, for the image appears readily, and proper density is easy to obtain on a properly-coated plate.

The sulphurous acid in Beach's developer is merely to correct the excessive alkalinity of the commercial sodic sulphite. That the mixed developer is sufficiently alkaline is proved by its action on the fingers when dipped in the solution, and test paper shows that No. 1 solution of pyro, sodic sulphite and sulphurous acid, to be by no means acid; blue litmus not being affected by it.

Doubtless hydrokinone or hydroxylamine would answer as well, the only objection to these developers being their high price. However, in photo-micrography, when taking negatives of scientific importance, cost would be only a minor consideration, and both developers should be given a fair trial. I hope to try them myself this winter.—I am, sir, yours faithfully, I. H. Jennings.

THE CLAIMS OF THE IDENTISCOPE.

Sir,—I perceive that in one of your useful "Notes" (of which, let me say, I am a "constant reader"), you state, *re* the identiscope, that "the inventor claims that when a line drawn through these [pupil] centres in each portrait coincides, the two portraits are of one man."

To this "statement of claim," my briefest expression is (pardon the abruptness), "No, I don't."

You proceed in your further note very fairly and fully, and without *lapsus*, to state the series of eleven points in which the two Tichborne portraits coincide; and you conclude, in effect, by suggesting Professor Galton as a referee. To this course I can have no objection. The Professor and myself will not for the first time have been brought into contact. In 1875, long before his composite portraits obtained deserved attention, Mr. Galton, in common with the other *savans* of the British Association (in that year meeting at Bristol), were furnished with printed details of the identiscopic process. Your own columns have likewise from time to time given to the public an inkling of what the inventor professes to claim.

The "Galton process" assumes, legitimately, the infinite diversity that prevails in the contour and details of the human face. The "identiscopic process" asserts, specifically, the abiding identity of the face of a given individual. No one can better be aware than Mr. Galton, that if the facts were not practically as I here state, then his multiplied arrangements for securing only the "points in common" of each of several separate identities would be mere superfluities.

In the matter of geometric nomenclature, that item which, from the first inception of the method, I have designated the "zero line," Mr. Galton has since denominated the "datum line." The signification is, of course, identical. I will conclude, under your favour, by stating, categorically, that which I really maintain.

I claim, then, to be the originator (1) of the *zero* or *datum* line; (2) Of the employment of the diameter of the iris (at its exterior rim) as the unit of an admeasurement proceeding from zero; (3) Of mathematically superposing, by the above geometric agency, photographic portraits, whether per actual negatives, or per the identiscope, the latter appliance being, after its kind, as you correctly intimate, of the nature of a *camera lucida*.

Then, as to the outcome of the method, I claim to have determined:—(1) That given photographs, if of the same person, shall, *cæteris paribus*, at all periods of adult life match mathematically at every point of the perpendicular. (2) That in such case, the units of the two admeasurements remain identical, and that the diameter-lines shall bisect the features identically at eleven specified points at the least. (3) That the exact converse of this is true, as it relates to the portraits of all other individuals: and that this is evidenced by the nature and results of the "Galton process." William Matthews.

EYES GOING WITH THE HEAD.

Sir,—Under the title of "Hints on Posing the Sitter," by Mr. H. P. Robinson, that justly-esteemed artist, speaking of the position of the head, lays down the rule that "the eyes should always go with the head."

Now Mr. Robinson cannot but know that there is no hard and fast rule laid down by any of our great teachers in relation to the direction of the eye; on the contrary, every licence is given and taken by the most eminent painters, past and present, with that most speakable of all the features. Now, if artists could, and do, make so free a use of its direction in relation to the position of the head, why should not photographers use the same liberty?

I think it is a great assistance to have certain necessary laws to guide us in the study of nature; but I also think that we can have too many. The following list will prove that our best painters acted contrary to Mr. Robinson's new theory:—Boschaert, painted by Vandyke (Vandyke painted nearly half of his celebrated heads in the pose condemned by Mr. Robinson); Raffaelle, painted by himself; Sir Josh. Reynolds, by himself; Michael Angelo, by himself.

All the above are three-quarter face, eyes full front.—I am sir, yours truly, J. Randolph.

APPARATUS AT THE EXHIBITION.

Sir,—It seems not to have occurred to your "inconvenienced correspondent" (see last week's News) that the crowd round the apparatus table which so roused his ire, is itself an evidence of the interest taken in the exhibits there shown. For myself, I am glad of the opportunity of inspecting many of the articles. Take the shutters, for example: it is not easy to form any opinion of these from the descriptions given in the papers, or from advertisements, without actual examination and handling; and it is not very pleasant to go round to the various shops and ask to be shown the articles, and then to depart without purchasing, with some lame excuse. The expression of resigned sorrow on the face of the assistant on such occasions (where it is not indignant disgust) is really too much for my nerves; besides, the better part of a day would be taken up with a much less satisfactory result than when all can be seen together and compared. The same with other pieces of apparatus. I do not even object to showing the same thing, if good, year after year. Fresh men are turning up to whom much must be new. What seems to be required is more room. The special lighting of a picture gallery is not necessary for such a purpose, and perhaps there may be rooms in other parts of the building which could be made available for a still larger display of apparatus. R. Sedgfield.

EXHIBITION AWARDS.

Sir,—Perusing the many letters of complaint and indictment which have been launched against the unfortunate heads of the judges, one cannot help feeling that the writers have in many cases been somewhat hasty in their accusations, and scarcely fair to the committee. All the letters up to the present omit to mention any fairer method of arriving at the award than that adopted by the committee, and carried out by the judges, detailed in your issue of a fortnight ago.

I am informed by the Assistant Secretary, Mr. Cocking, that these judges held no communication with each other with regard to the pictures until their numbers had been given in, and only those who cast the numbers knew at the time where the medals would fall; and as these additions were made principally by the President himself, there can be no question about the honesty of the results.

The main offender, which puts the backs of indignant correspondents up more than any other picture, appears to be No. 234, "Interior of St. John's Church, Malta," by Signor Tagliaferro. At the time the award was made this gentleman was unknown to every member of the Committee but one, and that member had nothing to do with awarding prizes; but this one member asked the signor to exhibit his photograph, instead of taking another as he had proposed. This picture, like all others, went before the judges, designated by a member only, and it is absurd to imagine that the men who examined this photograph did not see the converging lines and thoroughly comprehend the cause; but they saw something else besides the converging lines, and what they did find was merit of a high description, and allowed the perceptible merit to outweigh the faulty lines, and placed high figures as the measure of their commendation.

Correspondents should bear in mind that those gentlemen who consent to become judges must give up any chance of a medal for themselves; and if, in addition to this, the judges are to be vituperated collectively, and sneered at individually, it will deter gentlemen from accepting the onerous duties attaching to the appointment at all. No unbiassed critic can go round the room and not admit that among the exhibits by the judges there are pictures that would have carried a medal had they not been so debarred. I, for one, see no reason to complain, although I am

An Exhibitor but not a Medallist.

PHOTOGRAPHS OF THE PRINCE OF WALES.

Sir,—I think I may safely assert that all the members of the Royal family have been the best supporters that the photographic profession have had.

I quite agree with what Mr. Methven says, that "it is misleading for persons to use Royal Arms, Feathers, &c. (though perhaps it helps to feather their nest), when they have not been patronized by Royalty, and have only taken a photograph of Balmoral." But who are the English photographers of great reputation? I could mention many names of photographers who are considered to be real good hands at their work, and do it themselves, and live in fashionable thoroughfares; and, if I mistake not, it is many of these that the genial Prince has honoured with his patronage. But they are not "touters."

If Mr. M. is the English photographer of great reputation, perhaps he feels "slighted," "blighted," and would like to be "knighted," so that he could be taken to the Royal arms at once; and I can only say another person who would like to be served the same way is yours respectfully,

James Syrus Tulley.

Dear Sir,—A letter appears in your last signed "H. J. Methven," complaining that "it is a fact capable of proof that the Prince of Wales has never been photographed by any English photographer of great reputation," and that he seems to be led by servants to small touting men. I subjoin a list of about thirty photographers—English and foreign—by whom the Prince has been photographed, and your readers will see it includes the names of the most successful photographers of England and the world during the last twenty years.

Mr. Bassano; Mr. J. E. Mayall; Mr. Mayall, Jun.; Messrs. W. and D. Downey; Messrs. Southwell Bros.; Messrs. Elliot and Fry; Mr. John Watkins; Mr. Charles Watkins; Mr. W. Mayland; Messrs. Hills and Saunders; Mr. Godfrey Allen, Bristol; Mr. George Cooper, Hull; Messrs. Turner and Drinkwater; Messrs. G. W. Wilson and Co., Aberdeen; Mr. Vanderweyde; Messrs. Byrne and Co., Richmond; Mr. Jabez Hughes; Messrs. James Russell and Sons, Chichester; MM. Ghemar Frères, Brussels; M. Geruzet, Brussels; M. Levitzki, Paris; M. Nadar, Paris; M. Joliot, Paris.

No doubt there are many I have omitted.—Truly yours,

Samuel Fry.

Proceedings of Societies.

Photographic Society of Great Britain.

A meeting was held in the Gallery, Pall Mall East, on Tuesday last, Mr. Payne Jennings in the chair.

The Chairman announced that, in accordance with the notice, there would be some explanation given regarding the apparatus shown in the Exhibition.

Mr. Watson called attention to the fact that he had found it convenient to make the swing-back of the portable camera with a strong outer frame, something like the arrangement adopted in the case of an ordinary studio camera. He also showed a small Kinnear camera, with a universal or "gimbal" movement to the front.

Mr. Sands next called attention to a cradle form of attachment for the swing-back, in which all the adjustments were made from the bottom, the frame containing the back being easily detachable from the cradle for placing at a position at right angles to the first. In this case the bellows turns round with the back, the fore end of the bellows being connected with a movable ring set in the front. Mr. Sands also showed a double slide shutter.

Mr. Samuels next made some remarks on cameras, these remarks having special reference to his changing-back, which was exhibited last year (see page 649 of our volume for 1883). The use of such a back rendered it advisable to construct the camera more strongly than is usually the case, and also to adopt the old system of racking out the lens, the back being stationary; and it becomes convenient to use the swing front rather than a swing-back. All these points of construction were exemplified in the small Kinnear camera which Mr. Watson had exhibited. Mr. Samuels also said he had used an external screw thread cut on the lens tube as a means of adjustment for focussing, this being an arrangement which has never yet found general favour with the users of lenses, although often proposed. Mr. Samuels also showed a tripod top made by screwing six screw-eyes in a triangle of wood.

Mr. Starnes showed his changing-camera (see page 614), and mentioned that as each plate is set upon the same stops, absolute register is secured.

The Chairman referred to the great importance of exact register in the case of slides and other plate receptacles, and said that he had found six out of seven commercial instruments to be defective in this respect.

Mr. Rouch exhibited his new shutter (see page 645), and a portable camera. He had found it very advantageous to have a number of clamping positions on the base-board, and a comparatively short rack, this system giving greater firmness than when a very long slide is actuated by a rack of corresponding length; in the case of Mr. Rouch's camera, the back is stationary, and the front movable.

Mr. Shew exhibited the camera adapter which we described on page 645, and the bracket top for a tripod, which was exhibited at one of the previous meetings of the Society (see page 559).

Messrs. Marion and Co.'s representative then called attention to a syphon washing trough for negatives, and to the print-washing apparatus which is figured on page 207 of our present volume.

The Chairman said a word or two in favour of washing negatives in a reasonable time, as he had sometimes found holes eaten in the gelatine when the washing was very prolonged.

Mr. S. O. McKellen said that it was quite sufficient to provide grooves along the bottom of the trough and on one side, this arrangement allowing any sized plate—if within the dimensions of the trough—to be supported in a vertical position. Instead of a syphon, Mr. McKellen prefers to make a small hole in the lower part of the trough, and to allow rather more water to run from the tap than this hole will give vent to. Under these circumstances the trough is always full, and a stream is constantly flowing through it.

Mr. McKellen then exhibited a portable camera possessing some novel features. The bellows is of the Kinnear form, while both front and back fold down upon the base-board so as to form an exceptionally thin and compact package. The tripod legs are attached to a brass top, consisting of a ring let into the base-board, and this ring turns freely, so that when the camera is once mounted, it can be quickly turned to any point of the horizon, and a screw serves to clamp it at the required position. The front is provided with a circular piece let in and working like a turntable, so that by using this arrangement in conjunction with the swing-front, any required side shift can be obtained, together with the needed rise or fall. The focussing done is by means of rack work and slides contained in the base, and movable screens are provided for covering half or three-quarters of the plate in case it should be desired to take two or four pictures on one glass.

Mr Warnerke explained the ingenious changing-box cameras of Professor Ezutchewsky (see page 645), and exhibited some glass plates coated with the Balmain phosphorescent composition. These he had found very useful in printing transparencies on gelatino-bromide plates; the phosphorescent surface being exposed to light until saturated, and then laid for a fixed period over the printing-frame containing the negative and sensitive plate. From five to twenty seconds' exposure to the phosphorescent light was generally required.

Mr. Furnell's shutter, and Mr. Hopkins' new dark slide arrangement, were then exhibited, and the method of working with the latter demonstrated.

Mr. Hart then showed a shutter made by Jonniaux, of Liège. It consists of a flap, A, provided with a needle, B, placed as shown in the subjoined sectional diagram. Over the needle B is the ring F, this ring being attached to a hinged piece C. The hinged piece C is lifted by the air-ball D, which expands under the influence of air forced in through the tube E. If the flap is only lifted until it is in a horizontal position, the ring remains on the needle; but if lifted beyond this position the ring passes over the end of the needle and the flap closes immediately. If a spring is attached to the flap an exposure as short as one-twentieth of a second may be made.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 23rd inst., Mr. J. Traill Taylor in the chair.

The Chairman, in a few introductory remarks, expressed his pleasure in seeing Mr. Ashman again among them, and called upon him to deliver his lecturette on toning.

Mr. W. M. Ashman, having thanked the chairman and the members for the sympathy shown him, proceeded with the lecturette (see page 693). Mr. Clemcuts undertaking the experiments. Mr. Ashman having concluded, the Chairman invited a discussion.

Mr. A. L. Henderson spoke in favour of sulphur toning; he regretted the introduction of the alkaline salts, and said they had not had stable prints since alkaline gold toning baths came into use; sulphur toning was by far the best.

The Chairman: Many years ago Mr. Shadbolt stated that sulphide of silver was the most stable of any of the silver compounds.

Mr. Henderson thought that was correct. In reference to preserved papers, he found an addition of uranium to the sensitizing bath caused paper so sensitized to become whiter by keeping. He had tried many experiments to obtain a preserved paper which acted as well as freshly prepared, but had failed. He obtained a paper which might be useful for amateurs by floating on acetate of silver and gold; upon moistening the prints, toning action commenced.

Mr. W. E. Debenham, in support of fading of sulphur-toned prints, said that some years ago he submitted designs printed with marking ink on d'oyles to the fumes of potassium sulphide, to blacken; soon afterwards, the designs faded just like a photograph. He noticed the print just toned with platinum became weak, like the acid gold toned prints which the lecturer spoke of. He had used platinum for toning transparencies, but neutralized the solution, and then made it faintly acid with nitric acid. Citrate of soda was one of the salts first employed in the alkaline method, so also was borax, a bath he still employed.

The Chairman: Reasoning from analogy, transparencies treated with potassium sulphide ought to fade, but they do not.

Mr. Henderson: They withstand the action of strong cyanide for a long time. If a faded silver print is restored by the platinum method I have suggested, the image is removed with strong cyanide. Perhaps the lecturer will explain why this occurs?

Mr. W. K. Burton considered an alkaline bath to be a mixture of gold chloride and a slightly alkaline salt; he had seen it stated that the salt added acted as a retarder. Was that an error? Is toning a galvanic or electro-gilding operation? He had seen good black tones obtained with a commercial salt of platinum, and a judicious mixture of this salt with the gold salt enabled any colour to be obtained.

Mr. A. Mackie: What is the reason prints turn red in salt and water? Why does an acetate bath require twenty-four hours to ripen when a borax bath can be used immediately?

Mr. Martin said it is an axiom in chemistry that colour is determined by the form and size of the particles; the size of the reduced particles in a weak negative would be different to the reduced particles in a strong negative. He asked the lecturer if there was any difference in the reduction of the particles in the prints.

Mr. Burton held that there was no difference in the size of reduced particles in strong and weak negatives.

Mr. Henderson wished the lecturer to state whether toning is a substitution or a gilding process.

Mr. A. Haddon said there was so little gold used that it could scarcely be substitution.

Mr. Leon Warnerke did not think acid at all necessary to the preserving of sensitized paper as mentioned by the lecturer; he (Mr. Warnerke) kept paper many months by the method published in one of Abney's books, viz., washing, and the use of potassium nitrite.

Mr. Burton had prepared paper in that manner, but single albumenized paper gave poor prints. Richer prints could be got with double albumenized.

Mr. Cobb's experience coincided with Mr. Burton's in using this preservative.

Mr. W. H. Prestwich preferred a plain gold bath without any other salts. He used preserved sensitive paper.

The Chairman then adjourned the discussion until the next meeting, and asked for a vote of thanks to the lecturer, which was accorded.

The sensitometers mentioned at the last meeting were sent by Mr. Bell to be examined; one registered 15, and the other 20, with plates from the same batch.

The meeting was then resolved into committee to adjudicate the prize pictures from a number sent by the Edinburgh Photographic Society for this Society's decision.

Cambridge University Photographic Society.

A meeting of the above was held last Wednesday for the purpose of electing officers. The following were elected:—

President—Mr. W. M. Shaw, M.A.

Vice-President—Rev. A. J. Chapman.

Secretary—Mr. C. F. Pritchard.

Committee—Messrs. L. Cobbett, H. M. Elder, M. Miley, and D. W. Samways.

Talk in the Studio.

South London Photographic Society.—On Thursday evening next, at the House of the Society of Arts, at eight o'clock, Mr. J. Traill Taylor will deliver a lecture entitled "Florida: Its

Orango Groves and Myrtle Bowers," illustrated by a series of photographs shown on the screen by the limelight.

Standard Weights and Measures.—The International Committee which has been sitting at Sèvres during the past year has just issued a voluminous report, and their investigations show that the standard metres and kilogrammes belonging to various countries are by no means identical, the Austrian standard kilogramme being, for example, 1·35 milligrammes too light. The report contains much detail likely to be of value to persons having occasion to make exact weighings or measurements.

Sham Photographic Agents.—Henry Hunt, aged 42 years, a canvasser, giving his address at a lodging-house in Kingsland Road; Edward Dudley, 37, a traveller, of 83, Cowper Road, South Hornsey; and Arthur Province, 24, a canvasser, of 5, Bruce Grove Road, Tottenham, were recently charged at the Clerkenwell Police Court on remand with having been concerned together in fraudulently obtaining a shilling from Sarah Ross, of 59, Highbury Quadrant, Islington, on the 16th inst., and also with having fraudulently obtained one shilling from three other persons in the same neighbourhood. The evidence for the prosecution was that the prisoners had obtained the money by falsely representing themselves as the agents of photographic firms, receiving the shilling payments on account, on the understanding that if they called at the photographers' their likenesses would be taken. On the prosecutors calling at the firms named by the prisoners they found they had been defrauded. The prisoners were committed for trial.

Death of Mr. A. E. Fradelle, Photographer, of Regent Street.—This gentleman, who died last week, was the son and grandson of well-known artist-painters, his grandfather's painting, "Rizzio and Mary Stuart," being one of the gems of the Duke of Norfolk's collection.

Schroeder's Universal Camera.—An ingenious universal camera was much admired at the Berlin exhibition, and one of its special features is the introduction of a musical box. Frequently as the musical box has been made use of to call the attention and to amuse juvenile sitters, we believe the incorporation of it into the construction of the camera to be a novelty to most of our readers.

Told in Camera.—The Innocent, knowing nothing of photography, was of course selected as the very best person possible to review the Photographic Exhibition in Pall Mall. This is his report:—Went to Photographic Exhibition as requested. Found walls hung with pictures. Never could make out why walls should be hung; always thought it was the pictures which, &c. Commenced at beginning of catalogue with the intention of going straight through, but as no steps were provided to enable me to see the skyed ones, gave up notion. Wanted to know the qualification of a skyed picture. Was it one when the *skyuro oscuro* was good? Secretary couldn't tell me. Pictures quite a success all along the line. Photography isn't an art, isn't it?

"But H. P.
Robinson he
Sez this kind o' thing's an exploded idee."

And H. P. Robinson proves it. His "Mill Door" takes a medal, the skill shown in it being by no means door-mant. T. M. Brownrigg has some lovely pictures. Particularly struck with the "Old Oaks, Adam and Eve, New Forest." My idea of the first-parent theory quite—always thought it a very old hoax. W. F. Donkin's collection of glacier photographs an ice one. Wanted to know, you know, why they weren't taken by Mr. Glacier, F.R.S., president of the Photographic Society. Secretary on his back again—couldn't say why. Extraordinary breaking surf at Bognor, by W. P. Marsh. "Bognor people had a surf-cit—eh?" Secretary turned the conversation and his head at the same time. "See Hester, by Valentine Blanchard," said he. Secretary wrong somewhere. V. B.'s picture is "*A Siesta*"—young lady under umbrella. Wanted to know why. Secretary ready with a *parry-plea*.—"You *must* look at Hubbard's 'Mother's Love.'" Splendid picture "Mother Hubbard's Love"—I mean "Hubbard's Cupboard Love"—hang it! "Lover's Other Cupboard." Dear me! Yes, really clever, and deserved the medal it got. Medal for H. B. Berkeley—"A Likely Place for a Trout (platinotype print)." Not likely, *I* should think—that is, not in a "platinotype print," picture *trout* to nature notwithstanding. West's yachting pictures perfect gems of the first water. Taken in a West wind, of course. "A Message from the Sea" (V. Blanchard)—capital. Tells its own story—to be taken, of course, with the usual old salts. M. Auty's photograph of lightning curious. Why wasn't it printed in Auty-type? Shadbolt's photographs from a balloon—cloudy, but odd. Not skyed, as I expected. Plenty of other splendid photographs haven't space to say anything about. My views of them very positive. Go and see 'em.—*Funny Folks*.

Photographic Club.—The next meeting of this Club, November 5th, will be the Annual General Meeting.

To Correspondents.

** We cannot undertake to return rejected communications.

Cambria.—It is rather a delicate operation, and if the paintings are valuable, you should send them to some person accustomed to the work. You will, however, run no risk in cleaning the surface with a soft rag moistened with methylated spirit, provided, of course, that you exercise reasonable care.

F. W. W. B.—We think not, as those who manufacture such productions buy the photographs for use on their own cards. Still, one may expect that there would be a good sale for them if introduced into the market; and if this were represented to the house you mention, they would probably act on the suggestion.

H. Howard.—If the central lens is a convex or magnifying glass, the focus will be shorter: but if a concave or diminishing glass, the focus will be longer. Probably two extra lenses were originally sent with the instrument—one convex and the other concave.

G. E. Bignell.—Thanks.

J. Button.—It is insufficiently washed, and no doubt enough bromide remains to make it very slow. If you emulsify longer or at a higher temperature, you must proceed with caution.

H. C. Garland.—We will obtain a copy of the rules, and post it to you.

Major M.—You must not expect to obtain quite such good results upon ready-sensitized paper as upon the freshly sensitized material. As regards the other matter, we will make enquiries and write to you.

G. E.—Turpentine will generally cause discolouration, so you had better use benzole; still, this latter dries so quickly as to occasion inconvenience.

F. H. C.—1. The lens you mention will answer very well for outdoor work, and when the light is good; but a portrait lens will be very much more suitable; one having an equivalent focus of about eight inches being best adapted to your requirements. 2. The best thing of the kind is the series of articles on "Posing and Management of the Sitter," by H. P. Robinson, which were commenced in our issue of the 10th inst.

A. G. M.—Either the first, second, or third on your list. There is, in fact, nothing to choose between them, as each is good.

H. De K.—There is no best, and if you go to one of the large houses from which professional photographers are in the habit of obtaining their apparatus, you will be well served. See our advertising columns.

A Novice.—Your pictures are good, especially that showing active life on the sands, and the sea and cloud piece.

S. S. Y.—1. You have probably come to the best decision, as one cannot judge from one example, but rather by the experience of photographers in general. 2. Thank you for your kind intentions.

Photographs Registered.

Dr. P. H. Emerson (Southwold)—5 Photos. of Figures and Scenery, &c.
Mr. J. Place (13, Bull Street, Birmingham)—Photo. of Bust of Matthew Bolton; Photo. of Statue of James Watt.
Mr. F. S. Seed (Widemarsh Street, Hereford)—Photo. entitled "The Village Corn Doctor."
Mr. H. Spink (West Brighton)—Photo. of Hove Police Force, 1884.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1366.—*November* 7, 1884.

CONTENTS.

ESTIMATION OF SILVER NITRATE IN THE SENSITIZING BATH.

THE common method of estimating the amount of silver nitrate in the bath which the printer uses is by means of an "argentometer," which is a rough form of hydrometer, with the stem graduated for grains of silver nitrate per ounce of bath. The estimation thereby made is commonly very inaccurate; in fact, is often no estimation at all.

The instruments sold under the name of "argentometer" are, as a rule, far from accurate, but the amount of inaccuracy in them is not, as a rule, great enough to give rise to mistakes likely to prove practically hurtful.

It is in the solution itself that is to be found the chief elements of inaccuracy. So long as the solution contains nothing but silver nitrate, the argentometer is a useful enough instrument. With a bath which has the by no means uncommon addition of nitrates, &c., or which has been much used, it is useless.

As paper is sensitized, the silver of the solution combines with the chlorine of the soluble chloride in the albumen, forming silver chloride; whilst on the other hand a soluble nitrate is formed which is dissolved in the bath. An old printing bath is thus always impregnated with some soluble nitrate, and it is, therefore, impossible to estimate the silver nitrate in it by taking the specific gravity.

It is a thing of importance to the printer to have some ready means which will not be affected by foreign substances, for estimation of the amount of silver nitrate in the bath. It is, of course, easy to precipitate the silver from a certain small portion of solution, as chloride by common salt or some other soluble chloride, to collect this on a filter paper, to weigh it, and to estimate the amount of silver nitrate which has been in the portion of solution taken; but this method takes too long a time, is too troublesome, and requires too nice measurement for most photographers. A volumetric method is certainly the best to adopt, and it so happens that there is one for silver nitrate which is particularly easy to perform.

The principle of this volumetric test depends on the following fact. If silver nitrate be added to a solution containing chromate of potash, and containing also either a soluble chloride, bromide, or iodide, the silver will combine with the whole of chlorine, bromine, or iodine present, before it combines with any of the chromium. When the whole of the bromine of the bromide (we will say of potassium, for convenience sake) has gone to form silver bromide, then the chromate commences to combine with the farther silver, and chromate of silver is formed; and as this is of a brilliant red colour, it is easy to notice precisely when the whole of the soluble bromide has been gone to form bromide of silver.

A simple experiment will explain what is meant. Into an ordinary glass of water is put a few grains of bromide of (say) potassium, and two or three grains of potassium chromate. When these are dissolved, weak silver nitrate solution is added drop by drop, the first-mentioned solution being stirred this time. As each drop of silver nitrate solution falls into the glass, it will be noticed that a brilliant red precipitate is formed, but that as the liquid is stirred the colour disappears. As each succeeding drop touches the solution, a longer time of stirring is required before the red colour disappears, and soon it will be found that it does not disappear at all, but is persistent. This means that we have added enough silver to combine with all the bromine of the bromide of potassium, and just a trace more which has combined with some of the chromium of the potassium chromate to form silver chromate. This latter trace may be disregarded, and it may be considered that we have added precisely enough silver in the silver nitrate to combine with all the bromine of the potassium bromide. We may now very readily estimate the amount of silver nitrate which we have used, if we know the amount of potassium bromide, or *vice versâ*.

To make actual practical use of the principle just explained, the best method is to use a graduated burette and a pipette. With the latter, a certain amount of the bath solution is taken, and is placed in a glass of water. From the former a solution of (say) bromide of potassium, rendered yellow with a little chromate of potassium, is poured. This solution can readily be so made up that the graduation of the burette will read grains to the ounce of silver nitrate in the bath solutions.

This, we say, is the most perfect method of any, and is, in truth, very simple; yet we can explain one which, if not quite so precise, is more likely to be of practical use to the photographer. The only necessary piece of apparatus is a small graduated pipette, which costs threepence. The size of this does not matter at all, but the smaller it is the less bath solution will be wanted. As a rule, the smallest size of pipette which is sold contains two cubic centimetres. This requires the waste of some three or four grains of silver nitrate whenever we wish to test the strength of our bath. We should explain that this method is not strictly one of estimating the strength of the bath, but of testing whether it is above or below any certain strength that we have fixed upon. It is, however, quite possible to make a fairly accurate guess as to how much too weak or too strong it is.

The following is the precise manner in which we keep our own bath up to strength. A solution is prepared in the following manner:—

Chromate of potassium	2 or 3 grains
Bromide of potassium ...	quantity as to be explained
Water	up to 1 ounce

The quantity of bromide of potassium varies according to

the strength up to which we wish to keep our bath. From following table the blank in the above formula may be filled in.

For 20 grain bath		14	grains of potassium bromide
„ 25	„	17·5	„
„ 30	„	21	„
„ 35	„	24·5	„
„ 40	„	28	„
„ 45	„	31·5	„
„ 50	„	35	„
„ 55	„	38·5	„
„ 60	„	42	„
„ 70	„	49	„
„ 80	„	56	„

It will be understood that if, for example, we work with a 55 grain bath, we make a solution of bromide of potassium 38·5 grains to each ounce. The quantity of potassium chromate is of little consequence. There should be added enough to make the solution quite yellow.

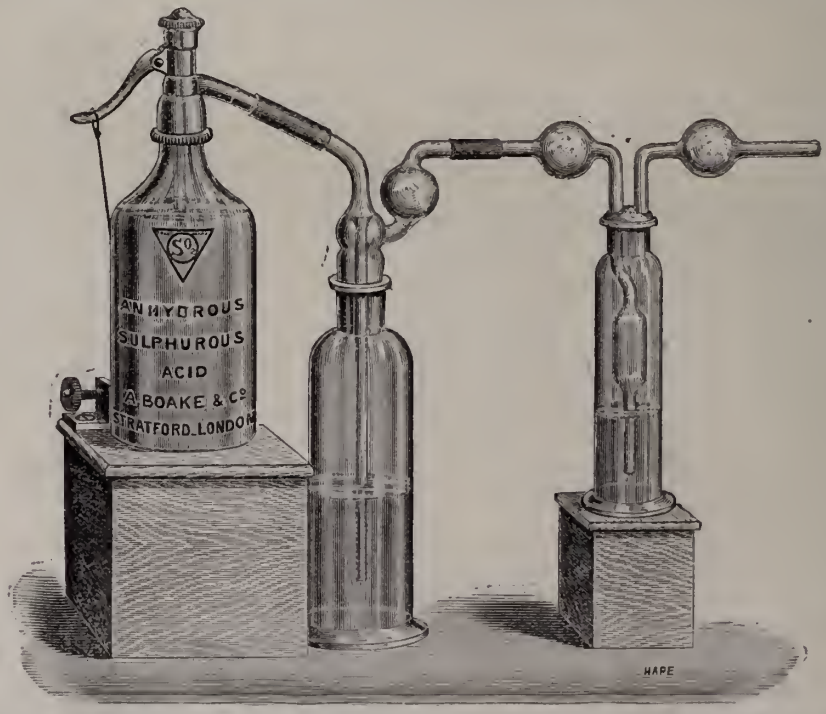
We now place in an ordinary glass three or four ounces of tap water. To this we add one pipette full of the bromide solution. The pipette is then washed, and is filled with the bath solution. This is added to the solution in the glass, drop by drop, with constant stirring. According as the amount of silver nitrate solution is just enough, is too much, or is too little to cause the red colour in the glass to be persistent, the bath is of correct strength, is too strong, or is too weak. By noticing how much silver nitrate solution is left in the pipette, or how much more has to be added to the glass of water to make the colour persistent, we may estimate about how much too strong our bath is, or how much silver nitrate must be added to it to bring it up to correct strength. The whole thing may be done in about a minute, and the estimation is correct, however much foreign matter is in the bath.

The exact quantity of water used does not matter, but very much more than that given should not be employed with a 2 c.c. pipette, because the chlorides in ordinary tap water cause a slight disturbance of the estimation. With a 2 c.c. pipette, and the ordinary run of London tap water, there is an error introduced of one grain for every three or four ounces of water used. This error is in the right direction, however, as it causes the bath to appear somewhat weaker than it in reality is. If distilled water be used, there is of course no error.

Much less than three or four ounces of water should not be used with a 2 c.c. pipette, or the precipitate will be in a spongy form, and there will be some difficulty in causing the red colour to disappear, which will make it appear to be persistent before it really is.

SULPHUROUS ACID FOR USE IN THE PHOTOGRAPHIC LABORATORY.

In our issue of September 5th, we described a simple method of preparing an aqueous solution of sulphurous acid, and pointed out the impracticability of purchasing the aqueous solution, owing to its bad keeping qualities. We also mentioned the fact that Messrs. Boake and Co., of Stratford, who are the principal manufacturers of sul-



phites and bi-sulphites, sell the anhydrous acid condensed in strong glass vessels, similar to the so-called syphon vessels used for aërated waters.

Finding that the potash developer of Mr. F. C. Beach is so universally praised by those who have tried it, but that the main objection to its use is the trouble involved in preparing the necessary solution of sulphurous acid, and the uncertainty arising from the use of sulphite of soda which has become converted into sulphate by oxidation, or was originally made with excess of alkali, we requested Messrs. Boake to give us particulars as to their system of sending out the acid in syphon-vessels, and the following description has been furnished by the firm :—

The figure shows one of the syphons connected with a very convenient form of apparatus for preparing a solution of sulphurous acid in water, or of sulphites, as may be required.

The syphons are easy to manage, the flow of gaseous acid being regulated with the greatest nicety by simply turning the milled head shown in the engraving, the liquid acid being gradually converted into gas as the pressure is relieved. There is, moreover, no danger attending the use of this simple apparatus; sulphurous acid exerting at ordinary temperatures a pressure of about 30 pounds on the square inch, while each syphon is care-

fully tested under a pressure of 200 pounds on the square inch before being sent out.

In preparing a solution, say, of sulphurous acid in water, the ground stopper carrying the tubes for passing the gas should be removed from the glass jar in immediate connection with the syphon, and two-thirds filled with distilled water; the stopper is then to be replaced, and the second glass jar half filled with caustic soda solution. The soda solution is used to absorb any sulphurous acid not dissolved by the distilled water, and so prevent the escape of this irritating gas into the air. Solution of sulphite of soda, and also of bisulphite, can be prepared in a similar way, substituting only pure caustic soda solution for the distilled water employed in the case of preparing the solution of sulphurous acid; but we must rather advise the purchase of the pure solid forms of these salts specially prepared, and put up by us in one-pound stoppered bottles for use in photography, these preparations can be obtained either direct from the manufacturers, or from any wholesale chemical firm. The syphons may be obtained either separately or already connected with the absorbing jars. It may be mentioned that these syphons contain about two-and-a-half pounds of liquified sulphurous acid, and can be refilled when required; but those requiring larger quanties can obtain the acid compound in copper drums.

In the above description it will be noticed that Messrs. Boake say there is no danger attending the use of the syphons, as the glass vessels are tested at a much greater pressure than that ordinarily exerted by the condensed sulphurous acid; but our readers must remember that a blow against a hard substance may cause the glass to become fractured, and that under these circumstances the bursting of a syphon might cause a serious injury. Still, if proper care is exercised, there need be no accident; but we would suggest that the condensed acid should always be kept in the coolest place available, as the pressure it exerts becomes much greater when the temperature is raised.

The above caution is necessary, as a bare statement that there is no danger may cause persons to handle the syphons without reasonable care. The risk is precisely analogous to that attending the use and handling of bottles containing ordinary aërated waters, only the irritating nature of the sulphurous acid must be taken into account. Instances have occurred in which serious injury has resulted from the bursting of a bottle of soda water; but few, if any, are deterred from the use of soda water or lemonade on this account.

THE PALL MALL EXHIBITION.

Fifth Notice.

Mr. P. H. Emerson's "Confessions" (No. 10) is only one of a series of admirable pictorial studies contributed by this gentleman, but of the series we much prefer three little pictures in a frame which has been terribly skied (No. 359). "After dinner rest awhile," "Tug of War," and "What's o'clock," are delightful little illustrations of child life; the "Tug of War," in which two little girls are testing their relative pulling strength, being perhaps the best. Good views on gelatino-chloride paper are contributed by Mr. S. E. Phillips (101, 471, 477); and Mr. S. H. R. Salmon has also excellent views taken in Sussex and Surrey (195), together with a charming little picture of a "Ewe and Lamb" (No. 104).

A good interior is that of "The Vyne, Bramshill" (No. 107), by Mr. Seymour Conway; and his views of North Wales (No. 326) are delightful, and will no doubt please those who care to take their holidays in the Principality. One frame only is contributed by Mr. G. T. Grammer, and this (No. 108) shows us some of the beauties of Herefordshire; but Mr. W. Muller, who comes next on our list, sends three exhibits, including Cornwall, North Devon, and Scotland (Nos. 110, 111, and 146). They are clear and bright, while the tone is a rich dark shade. The wet collodion process was employed by Mr. E. Fox in making his large and excellent picture of "Wick Hall" (No. 117); and this gentleman's interiors (293) are excellent.

Mr. John G. Horsey has no less than thirteen frames, almost an exhibition in themselves. "Early Morning" (No. 118) is good, showing us a flock of geese going to their field. It is strange that this exceptionally intelligent bird should be so slandered as it usually is. "Meeting of the Waters" (No. 121) is a striking picture, the mixing currents being wonderfully represented. Views of London Streets are shown by York and Son (124, 629), and the work of these gentlemen is so well known that it is needless to say much as to the striking way in which the active streets are represented. The "Surrey Homes" and "Thuringian Forest Scenes" of Mr. H. G. Moberley (125, 278) are wonderfully pictorial; the fact of these photographs being printed on platinotype detracts nothing from their charms.

"Thoughts far away" (No. 127), by Mr. F. Whaley, showing a young woman in a meditative mood, is by no means a bad picture, and (No. 319) "Waiting for Nursie" has much merit; but the best of Mr. Whaley's pictures is "This little pig went to market" (No. 340). Does the familiar mode of saying the nursery *paters* or *aves* on a little one's toes as a rosary require explanation? But the little girl who is being nursed, herself nurses dolly, and appears a trifle non-plussed because the latter has no toes.

Water-pieces are evidently favourite subjects with Mr. H. F. McConnell, his "Fishers a Sailing out into the West" (No. 355) being, perhaps, the most pleasing.

The shades of approaching night are very strikingly rendered in the "October Evening" of Mr. A. D. Hatford (No. 131), and this gentleman contributes good views of "Cannes and the Neighbourhood" (389, 390). Four views of the "Cheeswring, Cornwall" (No. 133), by Mr. Alfred Dismorr, deserve mention, and this gentleman contributes several other frames of Cornish scenery, among which may be especially mentioned Nos. 273 and 274. No. 134 is a splendid example of military portraiture by Teich-Haufstangl, of Dresden; and we are a little surprised that these exhibits did not receive a medal. Hollyer's "Dandelions" (136) is a photograph quite standing by itself, soft, full of detail without violent contrasts, and in every sense a picture; the delicacy with which the seed puffs are reproduced being most remarkable. His "Lily Dado" (No. 307) we do not like nearly so well. Several new series of Mr. W. Cobb's inimitable street views of London are shown (139, 218, 495), and, if possible, we note an improvement on last year's work.

Many exhibits of great excellence are sent by Mr. E. Smithells—"After a Gambol" (No. 238), representing three dogs open-mouthed and panting, being, perhaps, the best. A lady, with a guitar, forms the subject of Mr. F. Ruston's exhibit (150), and he quotes Tennyson to illustrate his picture. Mr. G. Selwyn Edwards is happy in river scenery (162, 163, 164), the best picture being one on the Cherwell. Mr. Winter, of Derby, contributes good studies, "Undecided" (No. 174) representing a young woman who does not know what to say in her letter, being, perhaps, the best. The views of Mr. W. G. Macmillan, of Cambridge (175, 176, 177), are good; the old church at Doncaster being especially noteworthy.

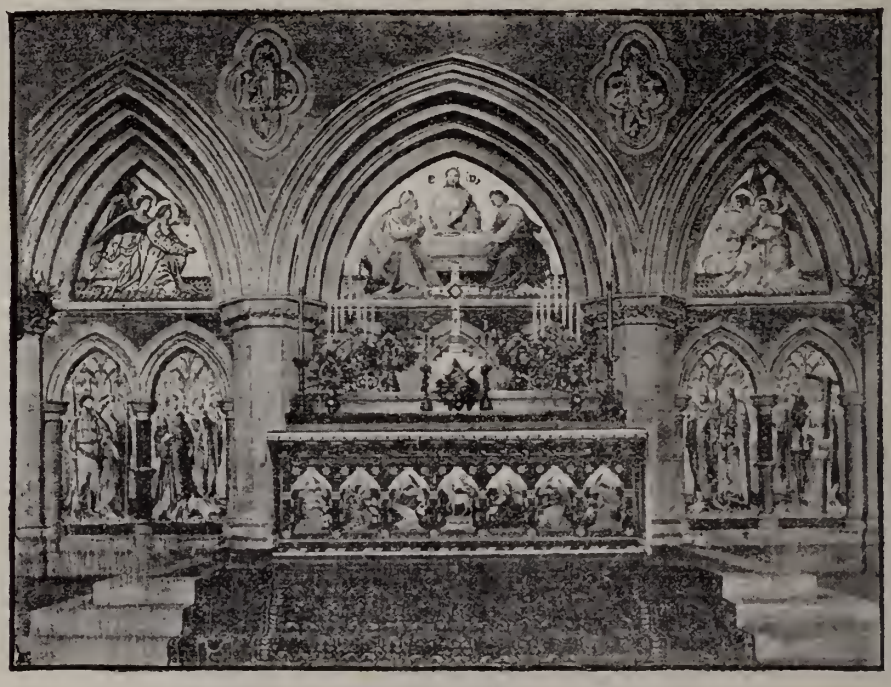
Mr. J. E. Mayall contributes magnificent specimens of photographic portraiture, not spoiled by retouching like some of the portraits which have been admitted. The most attractive is the delightful study of a little girl "Marguerite" (284); and the splendid portrait of the President of the Photographic Society, taken by the electric light (No. 546), merits exceptional praise. Mr. Frank E. Sutcliff's charming study of two fisher girls "Under the Cliff" (No. 224) should not be passed over by the visitor, and Mr. R. Keene's excellent productions (255, 384, 460, 466, 469, 547) should be noticed; the portrait of a lady taken in a private room (No. 384) being remarkably good.

A goodly collection of views from the camera of Captain Abney is to be found in the Exhibition, and the quality

of the pictures speaks loudly in favour of the iodo-bromide plates on which they were taken; it is scarcely necessary to remark that Captain Abney prepares his own plates. A series of views on the Cherwell (field club size) are especially attractive; but some larger views of Oxford and of scenery in Wales are also shown. The gem of the collection is—to our mind—a "Study of trees" (No. 272). Mr. C. E. Abney contributes but one frame (No. 280), pictures taken near Bettws-y-Coed; the gradations of tone even in the deepest shades being reproduced with a perfection not often met with.

"Tales of other Lands" (No. 281), by Mr. R. Slingsby, represents two little girls reading, and has deservedly attracted much notice.

An interior of exceptional merit is now reproduced in our columns as a Meisenbach block: (No. 562) 'Altar of



THE ALTAR AT CHRIST CHURCH, ST. LEONARDS.
Negative by the Rev. A. M. Macdona. Phototype Block by the Meisenbach Co.

Christ Church, St. Leonards-on-Sea," by the Rev. A. M. Macdona. To obtain a bad interior is easy; but few who handle the camera really make good pictures of such subjects, and on the Continent it is notoriously difficult to obtain even passable interiors of the Cathedrals and Churches.

HINTS ON POSING AND THE MANAGEMENT OF THE SITTER.

BY H. P. ROBINSON.

CHAPTER IV.—THREE-QUARTER LENGTH.—LADIES.

HITHERTO I have spoken of the sitter generically as "he," meaning, however, to include both sexes, just as women and children are included in all mankind; but as I am writing this chapter exclusively on ladies, I must alter the sitter's designation for the time being to "she." There is also the apparent absurdity, in writing on this subject, of calling all your models "sitters," although they may not want seated portraits of themselves; but the term is so generally accepted and understood to include all those who go to be represented either by the painter or photographer, that I shall continue to use it.

The female costume, when it suits those who order fashion to have it picturesque, offers greater facilities to the artist who desires variety in his poses than ugly masculine garments will admit of. Besides which, other reasons conduce to the making of more effective pictures when a lady is the subject. A greater range of expression is allowable, and the occupations and amusements of ladies afford many motives and much help to the photographer, while the occasional beauty of the subject encourages the operator by compelling him to make really fine pictures in spite of himself. There is a natural grace about some women and children that gives harmony to their slightest movements, and a fitness to their most trivial acts, so that if they only move across the room, the eye follows them with a similar kind of pleasure to which the ear listens to melodious sounds.

But it is not how to make "beauty go beautifully" that the photographer wants to know, so much as how to manage and make the best of the ordinary sitter who comes to the studio in the course of every-day practice.

Much will depend on the age of the subject, but we will take it for the present that she is neither very old nor very young, neither a young girl nor an elderly matron. Something also must be allowed for the temperament of the sitter: difficult poses should never be tried with nervous or awkward people.

A general rule might be given in very few words: Make your pose very simple, but avoid the "front elevation" or "profile section" effect, to do which you must get variety in the lines of the figure; but in doing so, avoid the twists and contortions so much affected by some photographers. Try to get the feeling of life and motion.

To accomplish this, it is sometimes necessary to make your subject walk round the studio and suddenly stop at the point where you wish to photograph her, thus getting the effect of suspended motion which is often seen in statues, and gives such an effect of animation when properly managed. The Apollo Belvidere is a well-known example of the kind of pose I mean. The figure is suddenly arrested in its action to watch the flight of the arrow, and stands for a moment in a pose that gives great variety of graceful lines without exaggeration, and could have been

easily photographed. But to come down from the classic to the real, let us try to sketch a figure photographed on this principle. And I may mention here that it would be

easy to give a set of poses for imitation, but this would be bad for the student if he did not get at the same time the principles on which the pose is based, and learn the causes which lead up to the pose, as in the present example.

A lady walking past a table slightly stoops to pick up a book or a flower, and raising herself, turns her head to speak to a friend. This action, if made by an easy and graceful figure, is full of animation, and gives great variety. Sitters almost always place both feet flat on the ground as they stand for a portrait: this often gives great stiffness. In the pose just described, if the left foot rests on the toe, as in the act of walking, the gracefulness of the action is much increased, and there is more "go" in the figure.

The changes may be rung on this idea for representing figures in suspended motion. A lady sitting at her table or desk rises as a friend enters the room; she picks up a book, or buttons her glove. These are natural actions, and anything is better than the stiff, self-conscious position so often adopted. In attempting to give life and motion to a figure, avoid going to extremes. There are those who, overstepping the modesty of nature, put too much "gush" into their poses. There are also those of what might be called the invertebrate school, who contort their figures into ridiculously strained attitudes, in their endeavour to make them graceful.

As a rule for the ordinary lady sitter, there is nothing better than the simple attitude a figure takes when standing in a room with the hands together, or, for the sake of variety, one hand may be on the table or behind the back, care being taken to avoid any ostentatious display of pose. Let the art conceal the art, and not let the figure suggest the idea that every limb and finger and fold had been adjusted by the operator. On the other hand, it must always be remembered that those portraits which appear the easiest and most natural, owe their effect, not to letting nature alone, but to the skill of the photographer in seeing at once what wants correcting, and making the alteration on the instant, before the sitter has had time to tire. The best poser is he who sees at once what he wants, and knows the readiest means of getting it. Some posers are so skilful and full of resource that they take the portrait almost without troubling the sitter, making the sitting, as it were, merely a little episode in the midst of a pleasant conversation. These are the masters of the art, and I am afraid their number is small. The majority of photographers have to painfully feel their way and (the most conscientious of them who feel they must not only earn their money, but let their customers see that they are earning it) fidget their sitter about with so many alterations and adjustments, that the resulting picture often represents a much wearied sample of humanity, with all expression of life or feeling worried out of it.

Many photographers cannot get on without the eternal chair, by which they place every standing figure. It is the abuse, rather than the use of the chair, that is so objectionable. The heavy carved oak chair and *prie-dieu* have been already laughed out of photography, but there is nothing to be said against a neatly-designed drawing-room chair; this piece of furniture is always useful when used judiciously. It is better when its lines are cut up or carried off by other furniture, such as a table behind it; or its too formal lines may be broken by throwing a shawl partly over the back. A black lace shawl is of infinite use in a studio.

Seated figures are usually more easily managed than standing ones. There seems to be so much more for a seated lady to do than when in the standing position. Reading, working, sewing, drawing, writing, a cup of tea, all lend their aid. A great deal also can be done with a fan, which lends itself admirably to a variety of change of pose.

It frequently happens that when all other devices fail, a passable portrait can be got by making the sitter look down, as in reading a book, arranging flowers, knitting or sewing, thus evading the difficulties of staring eyes and open mouths.

The mention of the looking down pose somehow reminds me that a few words may be profitably said on the hands. One of the most difficult things on the stage, I have heard an old actor say, is what to do with the hands. This is a difficulty that occurs with fuller force to the photographer. Of great pictorial importance, when properly employed, they oftener are the cause of a portrait being rejected than any other part of the picture. The one great fault that ladies find is that their hands are too large, even when it can be demonstrated that they are in proportion with the head; and they will be found to be always so if they have not been taken with a lens of too short a focus, and if they are as sharply defined as the head. This erroneous notion touching the exaggerated size is traditionary.

Before the introduction of photography, which corrected many artistic mistakes, artists used to draw the hand so absurdly small, that when the truth was seen in photographs it was not believed. Still there is some truth in the hand being too large in many photographs, and the fact that to prevent this the hands must be in the same plane as the face, cramps the operator very much in his posing. There are positions of the hand in which it looks much larger than in others, especially where the broad back of it is seen, or where the two hands are joined together in a broad light, and look, at a little distance, like one hand. When the fingers are interlaced the effect is similar; so also when a long wrist is shown without being broken by a bracelet or other means.

It is better, if possible, to let the hand take its own position, and if it does not come gracefully, to try again. To alter the fingers much is seldom very successful, and if the sitter begins to think about her hand, it never looks either graceful or natural. Care should be taken that the light does not fall too flatly or strongly on the hands, so as to increase their apparent breadth or size.

A well-formed hand is a beautiful object, and is of great use pictorially. So much was thought of it by the painters of the last century, and affectation in posing and displaying the hands was carried to such a pitch, that in some pictures they are the principal objects, and the heads are accessory. Of course, the great object in composing a portrait should be to make the head the principal object, and the hands take the second place. Care should be taken that the fingers curve gracefully, and that the hand does not look like a claw. That a very little differ-

ence in position will make a vast difference in effect, is

shown in these sketches from photographs of the same hand.

Reviews.

Handbuch des praktischen Photographen. Von Dr. Paul E. Liesegang. Eighth edition (*Dusseldorf: Publishing house of Ed. Liesegang*).

As a book for study or reference, Dr. Liesegang's "Handbook of the Practical Photographer" is well known and much appreciated in Germany, and we can heartily recommend it to those readers who can work with comfort from a German text-book. Although the work in question contains more than 900 pages, it is by no means an uncomfortably thick volume to handle, as the paper is of the thin hard kind which is coming so much into use for book printing in the present day.

Dr. Liesegang's comprehensive work consists of five divisions: I. Photographic apparatus. II. The collodion process. III. Gelatino-bromide method. IV. Silver printing. V. Carbon printing.

Photographischer Almanach und Kalender fur das Jahr 1885. (*Dusseldorf, Ed. Liesegang.*)

Here we have a neat, handy little volume of rather over a hundred small octavo pages, and it contains much useful information of a general nature. We learn from it that there is a Custom's duty of about three-halfpence a pound on dry plates imported into the German Empire; the small duty being a decided advantage to the photographic tourist, as it diminishes the probability of the packages being opened.

Instruction in Photography. By Captain W. de W. Abney. Sixth Edition. (*London: Piper and Carter.*)

So well-known and thoroughly appreciated is Captain Abney's "Instruction," that to say anything in its praise is altogether superfluous. Indeed, its position as a practical guide for the beginner, and as a reference book for the advanced photographer, is thoroughly established. It is, therefore, needless for us to do more than point out that the "Instruction" has been brought up to date, and so much new matter added as to make the present edition considerably larger than the previous one. "Do not lay the wet process entirely on one side," says Captain Abney, "for valuable as the newer gelatine process is, there are some special kinds of photographic work to which it is less suited than the older one." We are glad to see that the directions for wet collodion working are not curtailed; a matter of some importance when we remember that several of the newer hand-books ignore wet collodion altogether.

NOTE ON SOME FURTHER EXPERIMENTS WITH THE HYDROXYLAMINE DEVELOPER.

BY ARNOLD SPILLER.

In the last number of the Photographic News was a full editorial description of a series of experiments with the hydroxylamine developer, as originally published by Herr Egli and myself. It is there stated that at least two grains per ounce of the compound should be used, and in some recent experiments of my own I have fully confirmed that statement, when using the commercial product. In our original experiments the hydroxylamine was probably absolutely pure, as it was prepared by Herr Egli himself, and thus, in our description, we advised the use of a much smaller proportion of the compound. With regard to the use of citric acid in the developer, I think that when water of average purity is employed, it is hardly necessary; but when very hard water is used, the acid should certainly be added to prevent the precipitation of calcium carbonate over the film.

Since our last communication was published, I have been trying the development of gelatino-chloride with this developer, and have obtained results even more pleasing. I find, by varying the alkali used, different tones are produced. Thus with potassium or sodium carbonate, a *sepia-brown* is produced; with caustic soda or potash, a *brownish-black;* with ammonia, a brilliant *purple;* and with alkaline carbonate, containing a trace of ammonia, a *chocolate.* A very curious result was observed when using the ammonia developer—viz., by increasing the exposure six-fold, and using only one-sixth the normal proportion of alkali, a bright orange deposit was formed.

In conclusion, I may state that full details of the *modus operandi* of the development of gelatino-chloride will be given in a paper which I am about to read before the Parent Society.

RECENT RESEARCHES IN STELLAR PHOTOGRAPHY

BY T. E. ESPIN, M.A., F.R.A.S.*

The application of photography to astronomy during the last few years has been very extensive. Until last year, however, it has been used chiefly for photographing isolated objects, such as the moon, the great nebula in Orion, or the comets. Professor E. C. Pickering, the Director of the Harvard College Observatory, United States, during his European tour, showed some negatives of large fields of stars. The instrument used by him was an equatorial stellar camera with an aperture of three inches, and with this he succeeded in photographing stars down to the eighth magnitude. During his visit here to address the Astronomical Society of Liverpool he showed me these negatives. The line of research seemed to me so interesting that I at once set to work to attempt the photography of certain constellations. A camera with a lens of two and a-half inches aperture was borrowed, and an ultimuth stand was converted into an equatorial. The exposures of an hour were done entirely by hand. The first negatives were shown at the second meeting of the Astronomical Society's session, and the council at once determined to ask for subscriptions for providing a suitable instrument. We quickly discovered that the purchase of any such instrument was entirely beyond our means; but at this state of affairs came a generous offer from Mr. Howard Grubb, F.R.S., to lend us what we required. The instrument arrived in March, and was very soon in position and at work. I must now give a brief description of it.

The lens is a compound lens of four and a-half inches aperture, and focal length of fifteen feet eight inches. It is fitted into an ordinary wooden camera. Upon the camera is fixed a finder of short focus. The only form of mounting admissible was that known as the "equatorial." The principle of the equatorial, as you doubtless are aware, is an axis parallel with the earth's axis of rotation. To this is affixed another axis at right angles to the first. The first axis is called the "right ascension axis;" the second the "declination axis." The convenience of this form of mounting lies in the fact that the star can be followed with one motion only. The equatorial is of

* Read before the Liverpool Amateur Photographic Association.

massive iron. The wooden camera is attached to this by screws, while a suitable counterpoise is affixed on the other end of the declination axis, so that the camera will remain in any position. The declination and right ascension axes are fitted with circles suitably divided. The iron mounting is attached by screws to a strong wooden stand. As the exposures have often to be of considerable length, a clock motion is added, so that the camera is kept fixed on a star during the required exposure. Additional slow motions are provided in the declination and the right ascension; the right ascension one is so contrived that the camera can be moved without stopping the clock.

The work which I was especially desirous of undertaking was the determination of the actinic magnitudes of the stars. The brightness of a star to the eye is the combined effect of all the rays of the spectrum that are emitted by the star; but the impression on the photographic plate is due solely to an isolated part of the spectrum. The action of light on the plate is greatest at the violet end, and decreases as the spectrum approaches to the red. You will at once perceive we shall have on the plate a totally different scale of star brightness. The more a star abounds in rays of great refrangibility, the brighter it will appear on the plate. A star of an orange or red hue will, therefore, be diminished on the plate, while a star of blue colour will be proportionately increased. Taking, then, the eye magnitude as mean magnitude, the photographs will show a certain number of stars superior and a certain number inferior to the mean magnitude. Now, a star is white to the eye, because the rays of all refrangibilities are in their proper proportion to produce the absence of colour. In about two-thirds of the stars this proportion is maintained. Taking these as our standards for the reduction of the plates, we shall find that in the case of two-thirds of the stars the eye magnitudes and the photographic magnitudes will agree; but in one third they will differ from the mean magnitude by a quantity depending upon the refrangibility of the rays they emit. In other words, the photographic magnitude gives us one of the factors necessary for the determination of the colour of the stars.

The question, then, to be solved is how to obtain photographs of large fields of stars, and how to reduce the photographic magnitudes from them. Now, with the rapid plates at present in use, daylight photographs may be taken in an exceedingly minute fraction of a second with a lens of a very small aperture; but for photographing the stars long exposures are needed, because the starlight is so faint. An object photographed in the daytime is photographed by the light it reflects, but the stars have to be photographed directly. The most sensitive plates now made ought to have their sensitiveness increased many times for stellar photography.

The quantity of light we have to deal with is, except in the case of a few bright stars, so small that long exposures are necessary. Now, length of exposure means increase of probable error. The errors fall under—(1), the instrumental errors; (2), temporary cloudiness of one part of the field photographed; (3), unequal absorption—the last a very difficult and complex matter. In the first place, it is never a constant quantity—not even from hour to hour; hence it is impossible to reduce one plate by comparison with another, supposing them both of equal sensitiveness. Each plate must be reduced separately. The first two sources of error have been eliminated by allowing the stars to drive. In this way the stars, instead of coming out as dots, come out as lines. Supposing a cloud to intervene in any part of the field: its presence is shown on the photograph by a break in the line. Supposing the stars were photographed so as to come out as dots: it is obvious that the cloud or mists present might pass undetected, and a serious error be introduced in the resulting magnitudes. The exposures for the ordinary zone work are generally between minutes and half-an-hour. On these plates stars down to eight and a-half magnitude are photographed, and on nights when the absorption is at a minimum, stars of even smaller magnitude.

The number of stars that can be reduced on any plate is limited by a curious fact, which came out in the reductions for the catalogue of the photographic magnitudes of five hundred stars lately published. This is over-exposure in an insidious form. If a be the quantity of starlight necessary to penetrate the silver film completely in half-an-hour, it is obvious that all stars whose light is greater than a will penetrate it before half-an-hour, and the action also perpendicular to the plate will immediately cease. At first sight it would seem easy enough to tell where this has happened, for all stars whose light is greater than a would come out the same. If the rays of light passed through a medium whose refractive power was constant during the exposure this would be so; but in the case of the air the quantity is never constant nor similar in any two directions for a moment, and hence the light is spread out all round the star's image. The action on the plate thus resolves itself into a vertical and horizontal action—the vertical being due to the star's light falling directly on the plate, and the horizontal due to disturbance of the star's image by atmospherical inequality.

You will see at once, then, that if we attempt to determine the magnitudes of stars greater than a we really use a different method to that in the case of stars less than a. In the former, we use the horizontal impression, which is purely due to spurious discs caused by the lens and by atmospherical inequality of refraction; and, in the latter, we make use of the vertical impressions on the plate due solely to the star's action. The value of a is affected by three things:—(1) Length of exposure; (2), aperture of lens; and (3), the sensitiveness of the plate. From the photographs already taken I have been able to get a provisional formula for the equatorial stellar camera from Wratten and Wainwright's "drop shutter" plates. Having the aperture constant and the sensitiveness of the plates supposed to be constant, the following formula is approximately true for exposures under one hour:—

$$a=\sqrt{T}$$

When T is the length of exposure in minutes, and a the value of total penetration in magnitudes.

I may be allowed to point out that increased sensitiveness of the plates is more important than either size of aperture or lengthened exposure. If T equal the time of exposure, a the aperture of the lens employed, and S the sensitiveness of the plates, the joint results will be expressed by some relations of

$$T,\ S,\ (a)^2$$

Supposing this to be:—

$$P=\frac{(\sqrt{T}+\sqrt{S})\times(a)^2}{30}$$

—a provisional formula which fairly represents observations up to the present date—it is obvious that the increase of aperture is of more consequence than either increase of exposure or sensitiveness. But increase of aperture means increase of focal length and decrease of the field of vision; hence we are very quickly limited in this direction. Increase of T means increase of all sorts of errors, both instrumental and atmospherical. The only thing we can infinitely increase without error is S, the sensitiveness of the plates.

In conclusion: I must apologise for the incompleteness of this paper. There are several points to which I should have liked to draw the attention of the Society, namely, atmospherical actinic absorption, and to the importance of the new line of research in other respects. In the stars we have the past and future of our sun written in no uncertain hand. Intense energy is shown by the star being white, decline of energy by the yallow star, and the approach of extinction by the red star. The actinic light disappears first. Our sun has reached the second stage; each thousand years the actinic light will grow more feeble, till life will at last disappear. But the camera tells us that the universe is comparatively new, not above a third of its myriads having reached the second stage yet; and it tells also of universal slow decline. What powers of recuperation space contains we cannot say. Remove the actinic light, and we blot out life; increase it, and we have a luxuriant vegetation and contemporary prolific animal world. If it be true that our sun has reached the second stage, and it was in the first stage that animal and vegetable life appeared on the earth. With the decline of chemical light the sun's forcing power diminished, and life—vegetable and animal—adapted itself to the change by natural development, we should find, then, that in the first stage life was more prolific, but in the second more developed. An interesting path of speculation is open, but I must refrain. This age should be the age of exact observation; to the future belongs the teaching of these observations. But whatever the future discovers it will owe it in a great measure to your noble science—the science of photography.

Notes.

Who can question the excellent judgment of the arbitrators in awarding a medal to Mrs. S. G. Payne for her

charming picture, "Knuckle Down Tight," which forms our supplement this week?

It is interesting to note that such a study of every-day life is far more pleasing to the majority of people than the more lofty flights of fancy coming from the photographer who seeks to emulate the historical or the tragic painter.

As an element in the contest for the Presidential chair in the United States, the postage-stamp picture will be remembered, as many hundred thousand portraits of the rival candidates have been distributed.

M. Tonndorf, of St. Louis, makes the pictures in sheets of one hundred, ready gummed and perforated, and the charge for a single hundred of one subject is four shillings to the profession.

In giving examples of the portraits circulated—repro-

duced in the form of Meisenbach blocks—we place first the

portrait of Mr. Blaine, this being followed by that of Governor Cleveland.

It is easy to make the portraits, whether direct from life, or from an existing photograph, a camera mounted with a number of small lenses of rather ng focus being used. Let us suppose that there are ten [illegible]s in a row, and that there are ten shifts of the dark slide; one thus gets the negative of a hundred stamp pictures on one glass, a 12 by 10 plate being sufficiently large for the purpose.

The border and inscription are obtained by placing a suitable paste-board mask or foreground immediately in front of the sitter or before the original photograph.

The possibility of making printing plates or blocks for real stamps has already been suggested in our columns, and the above blocks practically illustrate the idea.

Before leaving this subject, a word or two about gumming and perforating. Before applying the gum, it is convenient to tack each print face downwards on a board, and care should be taken that the mucilage is thick and fresh. Few photographers possess a perforating machine, but the best way to extemporise a substitute is to lay the sheet in the required position on a coarse file, and to then set a straightedge against the line of required perforations, after which a smooth hard body—as the back of a knife—is drawn long the line with some pressure. This ingenious and simple method of perforating is the invention of Mr. Zuccato.

Candles and oil lamps will, it seems, have to be the principal lights at the Royal Court of Justice for the next few weeks, as the authorities (who have evidently a devout regard for the ancient traditions of circumlocution) parted with the old electrical lighting plant long before the new engines and dynamos were ready for delivering. Only the electric current is required, as conductors and lamps remain fixed ready to hand in the buildings. If a commercial company required the same supply of electricity, it would have obtained it at two days' notice by placing portable engines and dynamos on the vacant ground which is adjacent to the Courts.

Our readers will remember that not long ago, a fire destroyed the electric lighting plant at the Liverpool Street Station shed, engines and dynamos all being burned.

Before the fire was extinguished, plans for a new shed had been drawn out, and materials for its construction were being loaded on trucks at a distant station; two hours after, a new dynamo was leaving the factory of the Brush Company, and a supply of power for the next day's lighting had been arranged for. As at Liverprol Street, there is a telegraph office in the Law Courts, and the Government has resources, stores and credit at least equal to those of the Great Eastern Railway Company, but there is no directive ability. The Staff of the Law Courts could, no doubt, largely and verbosely report on a dynamite explosion, should one occur in consequence of the want of light, but men are wanted who have energy and foresight enough to see that the light is provided.

The new magnesium manufactory, which has recently been established at Charlottenburg, near Berlin, may not do all it proposes—turn out magnesium at ten shillings

a pound—but there may now be some hope of a reduction in price. Numerous uses for the wire could be found, even if the price were four times that mentioned. The Berlin Company is preparing the magnesium by electrolysis: powerful Siemens machines being used.

An American photographer (of course down West) is said to have published an advertisement offering to take a score of photographs, for nothing, of the farmer that sent him in the largest water-melon, a fruit of which he was, by the way, inordinately fond. In less than ten days he had 406 sent in, so that beside eating himself in a state of "water-meloncholia," he was able to realize fifty dollars by the sale of the surplus melons at market rates. One thinks of advertising in a similar way for his winter potatoes!

Herr Makart's death has sent up the sale of large photographic copies of his principal pictures "with leaps and bounds." Those who know the prevailing characteristics of the late Hungarian painter's work will fully appreciate the comment made on this fact by a facetious contemporary: "The present demand for Herr Markart's pictures is a 're-nude' one!"

Hyposulphite as a fixing agent is rather tolerated than loved, hence Dr. Liesegang's recent experiments on fixing with a solution of common salt or a solution of ammonium chloride, or with ammonia, possess especial interest (see p. 714).

Thus may one briefly sum up his results. Collodio-chloride prints, citro-chloride films, and gelatino-bromide plates, may be satisfactorily fixed by means of a strong solution of chloride of sodium (common salt) or chloride of ammonium, but the latter is to be preferred. A little ammonia added to the bath expedites the fixing action.

Apart from the desirability of no longer using hyposulphite, it appears that the ammonium chloride fixing bath has the advantage of requiring less exposure and giving more delicacy in the half tones, as little or no reduction takes place during fixation. It is also stated that less gold is required in toning.

Prints on albumenized paper cannot be completely fixed in Dr. Liesegang's chloride bath, as only the chloride of silver dissolves, leaving the albumenate of silver in the paper; but firm as the position of albumenized paper appears to be as a printing material, we cannot help thinking that the great advantages of the collodio-chloride and the gelatino-chloride processes will become generally appreciated before long, not the least of these advantages being much greater permanency.

The *World* this week has favoured its readers with a "Celebrity at Home," in the shape of "The Lord Mayor-Elect at South Kensington." It cannot, however, be said that we learn much about the worthy Alderman. He is described as "pacing up and down the crimson drawing-room," and we are informed that "he has a grave and thoughtful face, as befits one on whom is about to descend a dignity which dates back from some seven hundred years of English history." It is also pleasant to know that Alderman Nottage "carries his sixty years lightly enough," and that "there is a merry twinkle in his bright eye, and lines of humour play about the mouth, which manifestly confirm his reputation as one of the most genial and amusing of companions." But when the interviewer has catalogued a statuette by Magin of the Alderman's daughter, two landscapes by Unterberger, a painting "by Rebossi of a lady with a guitar, which apparently moves (which—the lady or the guitar?) with the spectator," and Cruikshank's etching of the last man on the jury at the Tichborne trial, and has given us the Alderman's opinion on the Municipal Bill, he has told us all, and it has taken him three-quarters of a page of the *World* to tell it. There is scarcely a word about photography. Why didn't the interviewer draw out the Lord Mayor-Elect on the subject? Surely he must have many interesting photographic stories to relate?

A school of photography is shortly to be established at the Franklin Institute, Philadelphia.

If M. Miquel's researches are to be relied upon, ·03 parts of silver iodide, or ·08 of silver nitrate, exercise as active an antiseptic action upon beef tea as 1 part of salicylic acid or 3·2 parts of carbolic acid.

In the *Journal of the Chemical Society* one finds an interesting study regarding the influence of light on vegetation; other conditions being favourable and equal, the growth of the plant is almost directly proportioned to the intensity of the light.

From the same source we learn that Ricciardi appears to have finally settled the question of the slow re-combination of an oxyhydrogen mixture in the dark: he finds that no re-combination takes place, and in the *Chemical News* we learn from Mr. T. D. Bruce that if silver oxide is precipited from solutions cooled to 50° F., it is obtained in the truly hydrated condition; it being then flocculent and snow white. It is necessary to dissolve the silver nitrate and caustic potash in ninety per cent. alcohol, as aqueous solutions would freeze. These observations may form the keystone for interesting photographic investigations.

A paper on the detection of a trace of iodine in bromine, by Dr. Brito, which is to be found in the same number of the *Chemical News*, shall be printed *in extenso* as soon as we can find space.

On Thursday evening, the 13th instant, the Photographic Exhibition will be specially open for the benefit of the Photographers' Benevolent Association, the price of admission being sixpence. We hope that many will be present.

We alluded last week to the paper bottles now so

numerously made in Paris. But there is a still newer and more wonderful use to which paper is now turned. Paper pulp is employed in the manufacture of the most delicate of the wheels to be found in the internal mechanism of a watch. Paper is so gladly adopted because the wheels made fron it are not affected by the changes of the temperature, but "all unchanged down the grooves of time." This is, indeed, a topsy-turvey age, though, with its paper bottles, glass dresses, unintoxicating rum, grass paper, and pulp watch wheels!

Patent Intelligence.

Applications for Letters Patent.

14,457. Cleveland Green and Louis Varley Fudge, 128, Colmore Row, Birmingham, for "A new or improved actinometer."—Dated 1st November, 1884.

14,516. Alfred Julius Boult, 323, High Holborn, Middlesex, for "Films, plates, or tissues for use in photography, and process of manufacturing and using the same."—Communicated by George Eastman and William Hall Walker, United States.—Dated 3rd November, 1884.

Patent Sealed.

2767. Frederick Woodward Branson, of Leeds, in the county of York, Pharmaceutical Chemist, for "Improvements in photographic 'shutters.'"—Dated 5th February, 1884.

Patent on which the Seventh Year's Renewal Fee of £10 has been Paid.

4244. Charles Emile Reynaud, of Paris, in the French Republic, for an invention of "An improved apparatus for the production of optical illusions, called the 'Praxinoscope.'"—Dated 13th November, 1877.

Specification Published during the Week.

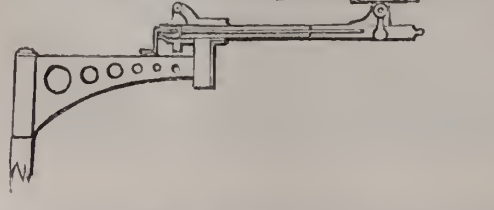
175.—William Morgan, of Cannon Street, Birmingham, in the county of Warwick, Manufacturer, for "Improvements in the production of picture and other like mounts." Dated 1st January, 1884.

Picture mounts are ordinarily produced by cutting or taking out the middle part of a sheet of cardboard or millboard, and thereby leaving an open space in the middle thereof. The part left forms a continuous frame which constitutes what is commonly called a mount.

The object of my improvements is to reduce the cost of manufacture incidental in the production of picture and such like mounts, by forming or producing such mounts from suitably prepared strips or lengths of cardboard, millboard, or other suitable material of the desired breadth, and cutting the said strips into suitable lengths with mitred ends, and afterwards uniting the said ends so as to form a frame, by means of clips and joint backings.

Patents Granted in America.

306,721. Ezra Cope, Hamilton, Ohio. Solar Printing Apparatus. Filed May 22, 1884. (No model.)



Claim.—The combination, substantially as set forth, of a main support for an exposure apparatus, a hollow arm attached at one end to said support by a journal of rotation with its axis horizontal, a lever fulcrumed at the free end of said arm upon a pivot-axis arranged at right angles to the axis of said journal of rotation, an exposure apparatus, as a printing-frame attached to one end of said lever, and an adjusting-screw housed within said arm and engaging said lever.

FIXING SILVER PRINTS AND GELATINO-BROMIDE PLATES WITHOUT HYPOSULPHITE.

BY DR. PAUL E. LIESEGANG.

It is a well-known fact that small quantities of chloride of silver are soluble in ammonia as well as in the chloride of sodium, chloride of ammonium, &c., but these solvents are not generally considered to be strong enough to be used as fixing agents for silver prints.

Being engaged in producing transparencies upon glass by the aid of the collodio-chloride process, I was struck by the thinness of the layer of chloride and citrate of silver contained in the films, and at once tried the above-mentioned solvents.

Liquid ammonia cleared the films immediately; a concentrated solution of common salt took about five minutes to dissolve the whitish film, the chloride disappearing before the citrate. I next tried to fix collodio-chloride prints on paper in the same way. Ammonia had the same effect as the usual five per cent. solution of hyposulphite of soda, but one cannot think of using it in large quantities and in open trays, because of its fumes.

Saturated solution of common salt is a little slow in its action; I therefore tried a saturated solution of chloride of ammonium, in which I left the prints for an hour. It may be that a shorter time is sufficient, or that even longer soaking is necessary, but my observations lead me to think that one hour is a safe time. The prints, not toned, come out of the bath with the same brownish yellow colour which the hyposulphite bath imparts to them. I washed the prints under the tap for a minute or so, dried them and exposed them, one half covered with black paper, to the light. They had a few hours of sunshine and two days of diffused light, and till now not a trace of difference in the protected and exposed parts is to be remarked. Of course an exposure for this time is not by any means sufficient to prove that the fixing is perfect, so I shall leave the prints in the window, and report on their behaviour.

I next toned a batch of prints in the same way as I usually tone them, in an old gold bath, with tungstate of soda, and kept there for an hour in the chloride of ammonium. After drying they had an unpleasant slatey blue colour, showing that too much gold had been deposited on them. I therefore prepared another bath of prints, which, instead of ten minutes, I left only one minute in the old gold bath. In the chloride bath they took a vigorous purplish brown colour, but were somewhat over-printed, although I had taken care to print less than for hypo fixing.

Now if this way of fixing prints proves to be safe (only time can teach us), we shall realise the advantage of doing away with hyposulphite, we shall use less gold for toning, and also shorten the time of exposing in the printing-frame.

Comparing the prints with others fixed with hyposulphite, I find that the finest half-tones in the lights, as well as in the shadows, are better preserved, and that from under-exposed negatives better results are to be obtained.

If the chloride of ammonium does not sufficiently fix the prints, I am sure we shall succeed by adding to it some ammonia. The fixing might then be done in upright vessels, the prints being hung vertically.

Since writing the above I have tried to fix gelatino-bromide plates and albumen prints with a saturated solution of chloride of ammonium, and I have experimented with plates from German and from English makers. The result is, that I find a period of two to two and a-half hours to be sufficient to completely clear the film. By adding liquid ammonia to the bath, the time may be reduced to half an hour or one hour, according to the thickness of the film.

The salt bath dissolves the chloride out of albumen silver prints, but not the albuminate of silver, so that the albumen print darkens on exposure. The collodio-chloride prints mentioned in my last letter have had a few

days more of exposure to day and sunlight; they do not show any trace of alteration.

IODO-CHLORIDE OF SILVER EMULSION.

BY V. SCHUMANN.

In a recent paper in the *Wochenblatt*, this investigator relates his experience of gelatine emulsion containing chloride and iodide of silver. Gelatine films containing pure chloride of silver can only be used in the camera in exceptional cases; if, however, iodide be added, the resulting iodo-chloride films answer most of the purposes of a gelatino-bromide plate. It may be remarked that with gelatino-chloride emulsion an image is easily developed with pyro or oxalate; but, unfortunately, fogging is very liable to set in. On strongly diluting the developing solution and adding a large proportion of bromide, it is possible to obtain a clear deposit, but the image is so thin that is is quite useless for practical purposes.

Gelatino-iodide films possess totally different properties. The development is extremely slow, without any tendency to fog; thus the addition of a restrainer should be avoided. Iodo-chloride emulsion can be prepared either by dissolving the chloride and iodide salts in the gelatine solution, and then adding by degrees the silver nitrate; or by making two separate emulsions of chloride and iodide of silver, and then mixing the two after the washing process. It should be noted that the properties of a compound or a mixture of the two haloids are very different. A negative of the spectrum impressed on an iodo-chloride film, prepared by mixing the two emulsions, shows two coloured deposits. The red end of the spectrum as far as the G line is reproduced in the negative as a red tone, while that part of the spectrum from G extending to the violet appears as a greyish violet deposit. When using Stolze's potash developer, the difference of the two tones on the negative appears even more marked.

Experiments were instituted to determine the most suitable proportion of the silver haloids to be suspended in the emulsion. For this purpose three emulsions were prepared according to the following formulæ.

No. 1.—*Iodo-Chloride Emulsion.*

A.—Ammonium chloride	...	...	·64 gram
Potassium iodide ...	...	...	·05 ,,
Gelatine	...	...	1·5 ,,
Water	...	...	15 c.c.
B.—Silver nitrate	...	...	1·55 gram
Water ...	...	...	15 c.c.

No. 2.—Same as No. 1, but with ·15 potassium iodide instead of ·05; and 1·65 silver nitrate instead of 1·55.

No. 3.—Same as No. 1, but with ·64 potassium iodide instead of ·05; and 2·14 silver nitrate instead of 1·55.

To prepare the emulsion, A and B were heated in a water bath, and then mixed slowly, with thorough shaking. The mixture, after an hour's cooking, was allowed to stand over night; the emulsion was next washed for seventy-two hours, and after slightly diluting, at once poured over the plates. The emulsions prepared according to formulæ 1 and 2 transmit blue light, which, however, is much brighter than that exhibited by gelatino-bromide emulsion. No. 3 emulsion transmits an orange light.

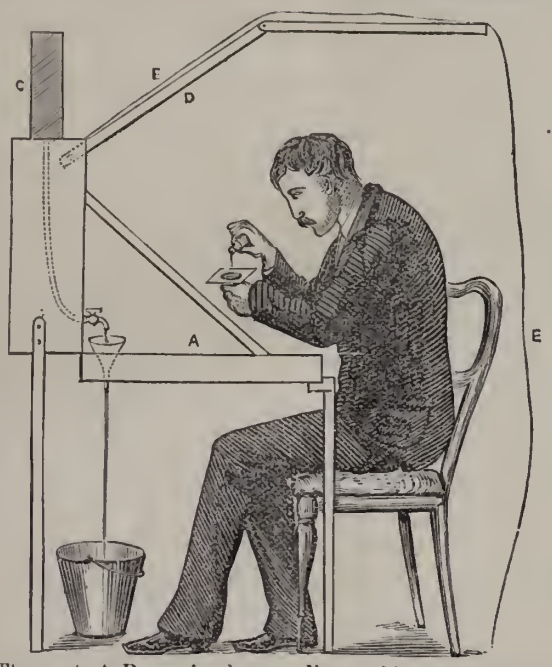
Previous to cooking the emulsion, a small quantity from each sample was spread on a glass plate, and, with the films prepared from the fully digested emulsion, were placed in sunlight. The unripe emulsion darkened much more quickly than that which had been digested. The colours of the exposed films prepared according to Nos. 1 and 2 were chocolate, and there was very little difference between the tones of the ripe and unripe emulsion. With the plates made by No. 3 formula there was, however, a great difference of colour noticeable; thus, while the unripe emulsion yielded a deposit not unlike that of Nos. 1 and 2, the films prepared from the ripe emulsion assumed a greyish-green colour, which did not alter even after some weeks' exposure to daylight.

PHOTOGRAPHY IN LLEYN.

BY J. VINCENT ELSDEN, B.Sc. (LOND.), F.C.S.

Perhaps no part of the British Isles is less frequented by the tourist than that part of Carnarvonshire which has received the name of the Lleyn promontory; and a description of a photographic tour in this district, as yet but little overrun by the camera, may be of interest to those who are in search of "fresh fields and pastures new," within easy reach of London.

To begin with, I will say a few words about a dark tent which was found extremely portable and convenient. The outside dimensions, when packed for travelling, were 24 by 12 by 6 inches, and the general appearance, when opened for use, will be seen in the subjoined rough sketch;



The parts A B are simply an ordinary oblong box and its lid. C is a small tin cistern, whence a small india-rubber tube conducts the water to a small tap inside the tent, the waste escaping by a funnel into a pail beneath. The legs are fixed by means of wooden screws. D is a jointed lath for the purpose of holding up the hood, E. The front part of this hood is made of cherry fabric; the back part may be of any cheap black material. The whole may be readily made, and the cost is but trifling. One point, however, deserves notice with respect to the cherry fabric. After the hood had been folded up several times, and packed in the box along with the apparatus, it was found that where the cherry fabric was creased, small pinholes were formed, and some red glazed lining had to be procured to lay over the front to obviate any risk of fog. Evidently, therefore, the cherry fabric is unsuited for rough usage. With this single exception, the home-made tent was all that could be desired.

One great feature of the Lleyn district is its total want of railway accommodation. We were, therefore, compelled to make a stay at Pwllheli, the termination of the Cambrian railway in this direction. Pwllheli is a quaint old town, and one or two interesting street views may be found; but there is nothing of any special attraction in the immediate neighbourhood. About four miles along the coast we came to Llanbedrog, charmingly situated amidst all the conditions necessary for a picture—wooded

glens, a rocky coast, quaint old cottages, and a fine hill rising from the beach. Along our route to this place we were able to secure a negative of a most interesting geological section, boulder clay lying in a hollow in a mass of igneous rock, and our thoughts were momentarily transferred to the times, far separated from one another, when the Lleyn promontory was a centre of volcanic action, and again, when huge glaciers conveyed their freights of rocky débris down the valleys. An easy excursion from Pwllheli is to Nevin, a small town situated on the North coast of the promontory. Here some charming subjects may be found. Along the beach are plenty of small vessels lying in all sorts of picturesque positions; innumerable remains of wrecks and shattered hulks break up the foreground; while in the background the fine old Eifl mountains give a grandeur to the scene which is rarely to be surpassed. Half-way between Pwllheli and Nevin is Boduan, the seat of Lord Newborough, where several excellent subjects may be obtained.

At Porth Abersoch we were fortunate in finding the tide out, and several coaling vessels in the process of being unladen by carts across the sands, giving a general appearance of activity and life to this picturesque bay, which contrasted strangely with the loneliness and inaccessibility of the spot. A good negative was secured here, without the necessity of either rapid plates or drop-shutter; and although a dozen horses figured in the scene, no movement can be detected.

No visit to Lleyn would be complete without seeing Aberdaron, situated almost at the extremity of the promontory, twenty miles from the nearest railway station. The village is scarcely seen until it bursts suddenly into view, reposing in a valley by the seashore, and hemmed in by hills which, from their close proximity, afford good positions for securing views. On descending to the shore a curious old church is seen, and we were again fortunate in being able to secure a view of a large wrecked steamer, a too common occurrence on this rocky and difficult coast.

A striking feature of the Lleyn district is, that although thinly populated, and without easy means of communication, there are many good hotels, and the country inns are often exceptionally large and clean. The pedestrian would do well, however, to provide himself with a good Ordnance map and pocket compass, as few of the inhabitants understand sufficient English to give intelligible directions.

THE CARBON PROCESS FOR AMATEURS.

BY T. B. ALLISON.*

THE carbon or Autotype process is one of the most beautiful of all printing processes, and having, as one of its principal attributes, the advantage of permanency, especially recommends itself to the amateur photographer, who, as a rule, only requires one or two prints from each of the negatives.

The tissue, having been immersed in the sensitizing bath three minutes, or until completely flaccid, it is withdrawn, and laid, face downwards, upon a piece of plate glass. A squeegee [one shown] made by screwing a strip of thick india-rubber between two laths, is passed over it, thus removing all excess of moisture.

Drying the tissue is, with most amateurs, somewhat of a trouble, but I have found no method so easy and satisfactory as the following:—Sensitize at night; let the room used be freed from deleterious gas or other fumes by passing a draught of air through it for a few minutes; the kitchen is preferable, as it is usually warm in the evening, and not too hot after all the household have retired to rest. Suspend the tissue by American clips to a line stretched across the apartment; come down early in the morning before daybreak, when you will find all the tissue dry and curled up. A door, or doors, of the drying room should be if possible left open, as the object is not so much to dry by heat as by a current of dry air. When dry, the tissue is, of course, ready for printing, before which operation, however, the negative must be prepared by making a "safe edge to it." This I do by drawing round the reverse side of the glass for about a quarter of an inch depth a margin of Brunswick black; this depth for 11 by 9, and proportionally less margin for smaller negatives. Now expose in a printing-frame, and as it is, of course, impossible to judge by appearance of the progress in printing, an actinometer [one shown] must be used.

For the remaining operations no chemicals are required, only plenty of warm water; and as we will say that we wish to imitate a silver print as much as possible, we will take a piece of plate glass, free from scratches, and which has been rubbed and polished with bees'-wax and turpentine, so that a slight film of that compound still adheres to it. Place this in cold water with the piece of exposed tissue; this latter will begin to curl up; then go quite flat again. At this moment bring both glass and tissue, face downwards, upon it, out of the water. Apply the squeegee so that all air-bubbles are expelled, and place aside to drain for a few minutes. Of course several pieces of tissue and glass may be similarly treated at the same time.

Now place the glass and adherent tissue in warm water at about 100° F. Agitate a little until you see the dark pigment begin to ooze from beneath the edges of the paper; lift up one corner, and the whole may be lifted from the glass, leaving behind an apparently slimy mass. Dash the warm water over this until you see the image distinctly, and the water comes off colourless.

At this stage it will be seen whether the exposure has been approximately correct. Should it have been too long, a little warmer water may probably reduce the image; if too short, use cooler water containing a little blue; but, as in other processes, a correct exposure always gives the best results. After an immersion in alum and water, place the glass plate with the developed image aside to dry; when dry, take a piece of "transfer paper" which has previously been soaked in cold water until flaccid; then in warm water until just slimy. Flood the glass plate with cold water, apply the transfer paper, "squeegee," and again set aside to dry. This time the image will, if left to itself, adhere to the transfer paper, and leave the glass, giving a highly polished picture.

For more detailed information, I refer you to Captain Abney's "Instruction in Photography." In practice, the carbon process is not a bit more difficult than silver printing, and although my description thereof has been somewhat lengthy, I hope my demonstration has been none the less interesting, and that some of you, after surmounting the principal difficulty of correct exposure, will adopt what, although having been called "blind process," is none the less a beautifully scientific and, from the variety of its applications, an exquisite adaptation of a simple phenomenon to photographic purposes.

* Abstract of a paper communicated to the North Staffordshire Photographic Association.

Correspondence.

APPARATUS AT THE EXHIBITION.

SIR,—Your correspondent, R. Sedgwick, has strange ideas with regard to the annual exhibition of the Photographic Society, as it appears that he would like always to see it as it is now, a kind of show-room where the stock goods of all the manufacturers can be inspected by customers too modest to look in the shop windows, or to ask to see the articles in the ordinary way. Of course, a kind of joint stock photographic goods show-room would be a convenience to buyers, and might be a source of profit to sellers; but to convert the Exhibition into a concern of this kind, and to allow it to be a centre for the distribution of price lists and circulars, must ultimately cause serious injury to the Society. A few years ago only genuine novelties of the year were admitted, and a mere variation in form was not considered a sufficient ground for admission. Now we see the same stock goods exhibited several years in succession. J. R. JONES.

DEAR SIR,—A great deal has lately been said and written as to the incongruity of mixing up an exhibition of pictures, and a trade exhibition of apparatus, with its accompanying price lists, cameras, instantaneous shutters, &c. Could not this be avoided in future exhibitions having by a separate room devoted to this, where the general public (those who get

pulling delicate pieces of apparatus about, and so ruining them before the Exhibition has been opened a week) would not care to enter, and where only those interested, and who knew how to handle such apparatus carefully, would find their way? An attendant possessing a little scientific knowledge, at a very small expense could easily be coached up in a day or two previous to the opening, and could explain the different pieces of apparatus. Walter B. Woodbury.

THE PHOTOGRAPHIC EXHIBITION.

Sir,—There appears to be much discussion respecting the awards to pictures hanging on the walls of the Exhibition, which those pictures sent in as glass transparencies have entirely escaped, and the press have not noticed, although they have written in detail about the paper photographs and apparatus.

If those pictures which have gained medals had been sent in only as lantern slides, judging by past experience, they would have obtained no notice whatever; as it is, they have not been quite ignored, as the transparencies have, notwithstanding that a medal was offered for them.

Transparencies on glass may be, and often are, equal as pictures to anything that hang around the walls; but being only photos on glass, they do not seem to be considered as pictures; and as they cannot be classed with tripod legs and apparatus, they are passed over in silence.—Yours truly, P. Fincham.

EXHIBITION AWARDS.

Sir,—Your correspondent signing himself "An Exhibitor but not a Medallist," says that no one has yet suggested any fairer method of arriving at the solution of the problem of awards than that now used by the Committee. Feeling deeply for them in their thankless task, I would suggest, for their relief, that the Photographic Society might take a higher and grander position than hitherto, and abolish medals altogether. The Committee cannot be infallible. The difference of opinion among the mass of photographers is most notable, and how often errors are made. One instance on the moment: "A Misty Morning on the Weir," to the astonishment of everybody, escaped a medal.

But if their abolition is not thought desirable, I have another idea which I think would disarm all grumblers. It is this: the Society should place a book in the Gallery for all the exhibitors and photographers generally to put numbers or marks, so as to indicate which picture each visitor thinks fittest for the award, his name and address being appended, and at the end of the Exhibition the book could be easily added up, and the medals awarded.

I do not wonder at the dissatisfaction expressed at giving a medal to a—well, a still subject. Surely, architectural things cannot rank with nature, sea, land, or living creatures, and the perpendicular being a little fanciful makes it worse.—Very faithfully yours,

Harry Pointer.

MESSRS. WEST'S YACHT STUDIES.

Dear Sir,—In the "Notes" of last week's Photographic News we see it is stated that our yacht studies in the Exhibition are exciting much controversy, and that some keen and practical examiners are contending that they are enlargements. It seems singular that our pictures are picked out for controversy; last year they were *elaborately retouched*, and when it was found they were not, another cry was raised that they were *flukes*; and now this year they are *enlargements*.

These accusations call to mind an anecdote we have read of a keen and practical examiner of stuffed birds, who, whilst passing a second-hand shop, was attracted by an owl perched on some goods. He immediately commenced pointing out various faults in the bird to a friend who was with him. "Look at his head," said he; "it is much too small, and the body is all out of shape; besides, who ever saw an owl sitting in that absurd way? and his eye—only look at it—it's much too large!" Presently the bird winked, and ruffled his feathers, much to the astonishment of the examiner, who very quietly walked away.

We certainly have had our yacht studies enlarged—some up to 48 by 36 inches—and they have been enlarged from the direct negatives, as the Autotype Company will testify; but the size of the direct negatives is exactly the same as the photographs now exhibiting.—Yours truly,

G. West and Son.

[Messrs. West and Son are to be congratulated on having made pictures which have so many good qualities as to excite the wonder and inventive faculties of ingenuous persons.—Ed. P.N.]

EYES GOING WITH THE HEAD.

Sir,—Perhaps I did not explain quite clearly what I meant when I said the eyes should go with the head; it would have been better if I had exaggerated the effect I intended to condemn in my illustration. The pose I deprecated is that seen in the portraits by Lely and Kneller, and the painters of their time, who seem to have supposed that the more a figure was twisted, the more graceful it became. In these portraits the figure would be turned to the right, the face to the left, and the eyes back again to the right. Now, if in this pose the eyes had looked in the same direction as the head—or, in other words, to the point to which the head is turning—instead of looking back again, the effect would be natural and graceful, instead of fantastic and artificial. A variation of this twisted posing is presented when the figure and eyes are full, and the face turned away. Mr. Randolph will see that I am not giving advice contrary to the practice of the painters he mentions, when I say that nothing can be more natural, simple, and easy than the pose of many of the portraits by these artists in which the figure is turned slightly away, the face three-quarter or nearly full, and the eyes quite full. In this case I hold that *the eyes go with the head*, because they are both going towards the same point. H. P. Robinson.

PLATES DAMAGED BY PACKING MATERIALS.

Sir,—The question of the deleterious effects of separating frames and boxes themselves on gelatine plates is important, and I hope to make some experiments on it. I have developed two or three plates lately which have been kept some time, and show distinctly that they have been injured by the chemicals in paper boxes or frames. It ought to be investigated, for as it is now, amateurs are just as likely to get hold of a damaged lot of plates ruined by chemicals in paper boxes or frames, as a good lot.

New York, Oct. 24. F. C. Beach.

[Now that the President of the Amateur Association of New York is about to take up the important subject referred to in the above communication, it is to be hoped that our readers will assist him by bringing forward such facts as may tend to elucidate the matter. Amateurs are, doubtless, the greatest sufferers, as they are more likely than professionals to allow their plates to remain for a long time in the packages.—Ed. P. N.]

EXPERIENCE IN LETTING A STUDIO.

Sir,—A friend of mine has had the misfortune to make the acquaintance of the "Midgets" so graphically described in a recent number (p. 634). His case would make an admirable pendant to that of your correspondent, under the title of "How I sold my photographic business, and was myself sold." Unfortunately, my friend is a foreigner, and does not feel up to placing the matter before your readers thus; but he thinks with me that an outline of his case may be a useful lesson to others in a like position, and I have volunteered to send you one.

My friend, whom I will call Signor G., advertised his

business for sale, and in the first instance had a correspondence with them. But though they were quite ready to buy at his price, *without seeing the business*, yet, as they offered a series of bills in payment, my friend declined. He advertised again, and then the female "Midget" came on the scene. She reopened the matter, assured my friend and his wife that their bills would be met, told them that she herself had private property, and talked of her rich relatives. At last, after some weeks' delay, her son appeared on the scene; and finally an agreement was come to, by which they were to buy the business. They were to give an acceptance for £100 at a month, backed by a responsible party, and the remainder of the purchase money was to be paid in cash within this month, they taking immediate possession. The responsible backer of this acceptance was to be a certain clergyman who had married the female Midget's daughter. Upon this Sig. G. permitted them to come in and take possession, but, fortunately, he determined to remain on the premises until he had the money, and his bill was met. They came on a Saturday night, and the next day, Sunday, and Monday they took possession of the studio, and took the orders *and the money*. On the Tuesday, Signor G., perceiving the sort of pictures they were taking, was convinced that he was no photographer, and that less than a month would ruin his business beyond recall. He therefore insisted on taking the pictures and the money, though he permitted them to remain in the house. And they were all this time asserting that they had the money lying at the bank. However, day after day one plausible excuse after another was made, but no money made its appearance. This went on for seven weeks; their bill, of course, was not met, the clergyman was not to be found, and the Midgets themselves would have absolutely starved but for the money with which Mrs. G. supplied them out of pure charity. At the end of the seven weeks, with no small difficulty, my friend contrived to get them out of his place. Their belongings—such as they are—they left behind, but such is their value that I think it is more likely to cost him a half-sovereign to get rid of them, than that they would realise him a shilling, so he has had a rather expensive lesson in business selling.

As these people are still in the flesh, and probably trying their plausible tales on fresh victims, my friend and I thought it might be well that your readers should be put upon their guard.—I am, sir, yours faithfully, S. S.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 30th ult., Mr. W. K. BURTON in the chair.

Mr. J. TRAILL TAYLOR showed examples of Lewis's "Incandescent Gas-burners," similar to the kind used at certain railway stations. In speaking of its illuminating power, he did not contrast it with the lime light; but as a substitute in lantern work for any of the numerous petroleum burners, he could speak from experience as to its superiority. Having explained the principle of causing a small jet of gas to impinge on a cone of platinum guaze and become incandescent, Mr. Taylor showed how the proportion of air consumed is determined by pressure. Within certain limits, the greater the pressure, so is the light increased in brilliancy. The advantages of this light for the dissolving lantern were pointed out, and Mr. Taylor concluded his remarks by introducing Mr. Lewis to the meeting.

In reply to questions by the chairman,

Mr. LEWIS said the ordinary ratio of air consumed was eight parts to one part of gas. The light was equal to four candles per foot. After six months' use the platinum was not oxidized, the weight remaining the same.

Mr. W. E. DEBENHAM enquired whether it was necessary to increase the pressure of gas with higher preasure of air?

Mr. LEWIS: No, the burner can be worked with gas at three-tenths pressure.

Mr. A. L. HENDERSON had seen the light exhibited by Professor Tyndall, who spoke highly of it.

A vote of thanks having been accorded to Messrs. Taylor and Lewis, the adjourned discussion on Mr. Ashman's Lecturette was resumed.

The CHAIRMAN, in re-opening the discussion, read an extract from Abney and Robinson's book on printing, wherein it states that salts added to gold are retarders. He (the chairman) found toning took place much quicker when borax was added, than with gold alone, and the tone was far better.

Mr. W. H. PRESTWICH obtained satisfactory tones with preserved paper and a plain gold solution. He washed the prints in three waters, the second containing washing soda. In reply to Mr. Debenham's query repecting Mr. Cowan's suggestion to try distilled water, he said he used one grain of gold to eight ounces of distilled water, and obtained very satisfactory results; there was no difficulty about it.

The CHAIRMAN used ordinary sensitized paper, and neutralized the gold bath in his experiment.

Mr. HENDERSON: In that case, the gold being just neutralized, free carbonic acid would be present.

Mr. HART said the advantages of toning with or without the salts usually added was largely influenced by the method of preparing the gold salt. It would be noticed, with some samples of commercial chloride of gold, that soon after breaking the tube, the crystals fall to the bottom in a wet mass, owing to insufficient re-crystallization. If the salt is re-crystallized a number of times, it remains practically dry in the air. Such a sample may be used with a minimum of added salts.

Mr. HENDERSON had tried a double salt of gold and tin, and thought at the time it showed some advantages. He could add a good deal of tin without throwing down the gold, and enquired if anyone had tried this double salt?

Mr. HART thought that a good deal depended on the condition of the tin. Stannous chloride soon became stannic. He had been engaged on some experiments with gold quite recently, in which tin was present.

The CHAIRMAN: Does Mr. Hart consider added salts to be retarders or otherwise?

Mr. HART replied that opinions differ widely on that subject, much depending on the sample of gold salt used. Some recommend washing out every trace of free silver; if this is done, then toning is slow. On the other hand, if the silver is left in, then decomposition of the gold takes place. In his own practice he gave prints three waters, allowing one pint of solution to each sheet all through the process, including toning, fixing, &c.

Mr. J. B. B. WELLINGTON: What would be the result of leaving a larger proportion of silver in?

Mr. HART replied that it would result in spotty prints, and the toning would be unmanageable.

Mr. A. MACKIE found ready-sensitized papers required a long washing before toning; half an hour was not too much.

The CHAIRMAN thoroughly washed some prints before toning, and others very slightly. These were mounted side by side; the latter have faded, but not the former.

Some further remarks on the theory of gilding *versus* substitution, in which Messrs. Debenham, Hart, and Henderson took part, brought the discussion to a close.

The LECTURER, in reply, said Mr. Henderson spoke in favour of sulphur toning being better than the alkaline method. Will he adopt it in the future? The Chairman (Mr. J. T. Taylor) bore witness to the stability of sulphide of silver; but it is generally admitted that sulphur-toned prints, if permanent, are less pleasing to the eye than those toned by the alkaline method. Is toning a substitution process? No. His impression was that toning action is similar to the well known experiment of coating a knife blade with copper, by plunging it in a solution of cupric sulphate; but with this difference—the latter is a direct action, whilst in toning, we deposit gold by double decomposition. It cannot be a substitution process, as the metallic layer beneath is not removed. With reference to strong cyanide removing a platinum deposit obtained in restoring a silver print, he said any other metal would be removed in the same way, strong cyanide having a solvent action on most of the compounds of the noble metals. Replying to Mr. Debenham, he said he was unable to tone a silver print with the platinum bath which that gentleman had mentioned, although it toned transparencies well enough. Replying to Mr. Burton, he said any salt added to the gold becomes a restrainer, but not in proportion to the quantity added. The following simple experiment would prove this:—Two grains of borax to one grain of gold tones a print in less than one-third

the time required when eighty grains of borax are used. Toning certainly is a galvanic process. In reply to Mr. Mackie's question, why do prints turn red in salt and water? he assumed that a layer of silver chloride printed in combination with an organic acid is of a red colour, and certain substances, such as acetic acid or common salt, act upon the free silver, and augment the colour of the organic image. Why does the acetate bath require time to ripen, &c.? Bi-borate of soda is an alkaline salt, and quickly neutralizes any free acid, converting it into common salt, which tends in a great measure to prevent mealiness. Acetate of soda, on the contrary, is a neutral salt, and liable to give up its feeble organic acid in favour of the more powerful mineral acid; as the action is slow, it has been found advisable to make the bath with hot water, shaking it up with a feeble alkali such as chalk, and thus, in allowing the fine particles of alkali to settle, obtain neutrality. In reply to Mr. Martin, there is reason to believe that the kind of bath used determines the size and form of the particles of deposited gold. Rapid toning, as advocated by Mr. Prestwich, will give a coarser deposit than a bath such as the acetate or borate. Mr. Hart's remarks on different samples of chloride of gold coincided with the lecturer's experience. Re-crystallising six times was not too many if it were desired to keep the salt some time.

Mr. T. O. McKellan then exhibited and explained his new patent camera, a description of which appeared on page 703. A cordial vote of thanks was accorded.

Mr. Debenham considered it a most excellent camera, and thought it was an advantage having the plane of the plate parallel to the lens.

Mr. Henderson showed plates badly fogged through keeping them in the slides a couple of months, and suggested that Mr. McKellan should devise a perfectly light-tight dark slide, as such was needed.

A discussion then ensued on the probabilities of leather hinges causing fog, several members taking part; but nothing new was elicited.

Mr. Henderson had a communication from Mr. Birrell (Scotland) in reference to a safe light; but owing to the lateness of the hour, it was decided to adjourn discussing it until the next meeting.

Mr. W. H. Harrison was elected a member of the Association.

The Hon. Secretary announced that Thursday, the 13th inst., will be devoted to the exhibition of lantern slides, illustrating the processes suggested by Mr. Debenham.

Postal Photographic Society.

A committee meeting of this Society was held at the address of the Hon. Secretary, 3, Plowden Buildings, on October 29th, Dr. Horace Day in the chair.

The minutes of the previous meeting were read and confirmed.

The Committee having inspected specimens of photographic work sent in by candidates for membership, elected the following gentlemen (some of whom had been provisionally admitted):—Hugh Heal, Hayward's Heath; C. J. Watson, Birmingham; S. H. R. Salmon, Croydon; C. F. Pritchard, London; Rev. W. Miles Barnes, Dorchester; Charles Yeomans, Sheffield; and Charles Baker, London.

Dr. Day then proposed that in future albums, where a member exhibits more than one print, the votes which are given him in respect of each exhibit shall be added together, and the member so gaining the highest number of votes shall take the prize. The motion was carried.

The prints in album 14 were considered, and it was found that Mr. J. W. Leigh's picture, No. 830, had the greatest number of votes; Mr. Mathewson being second for one of his pictures. The prize was accordingly awarded to Mr. Leigh.

Dr. Day was unanimously elected as President for the current year, and after several letters from various members had been read, and other business transacted, the meeting dissolved.

Liverpool Amateur Photographic Association.

The monthly meeting was held at the Free Library, on Thursday, the 30th ult., Dr. Kenyon in the chair.

The minutes of the September meeting having been read and confirmed, Mr. F. P. Paul, F.R.C.S., was elected a member.

The Chairman announced the donation of twelve prints to the album by Mr. W. H. Atkins, and also to the library of guide-books to Carnarvon and Ruthin, by Mr. Maurice Jones.

The Rev. T. E. Espin read a paper on "Stellar Photography" (see page 710), and passed round some negatives and prints in illustration of his remarks.

The Chairman, after complimenting Mr. Espin on the ability and scientific interest of his paper, asked if he considered that the sun had entered upon its yellow stage of existence.

The Rev. T. E. Espin said that spectroscopic observation tended to confirm this theory. He further adverted to recent experiments on the power of actinic rays in promoting vegetation and developing life.

The Rev. H. J. Palmer mentioned the case of a schoolmaster friend of his, who, under the conviction that the blue rays were conducive of brain power, had the walls of his school and class rooms coloured blue.

The Rev. T. E. Espin, in replying to a vote of thanks, said that he should be most happy to show his apparatus to any photographer who would visit the Observatory of the Liverpool Astronomical Society at West Kirby.

Mr. W. H. Atkins then gave a demonstration of his mode of making enlarged negatives with gelatino-bromide paper, and used an ordinary triplex paraffin lantern, with a Steinheil half-plate lens. The sensitive sheet was placed in an ordinary printing-frame, and the enlargement was one of five diameters, from a very good transparency from one of Mr. Atkins' own negatives. After exposure for some three minutes Mr. Atkins placed some non-actinic glass in front of his lantern, and proceeded to develop his picture with the pyrogallic acid and washing soda developer. After applying a citric acid and iron clearing solution, the enlargement was fixed in hypo and washed, and passed round for the inspection of the meeting. The result was a brilliant success, and great interest was manifested by a crowded meeting in all Mr. Atkins' manipulations.

Mr. Kirkby gave some account of his recent experiences with the platinotype process.

Mr. W. H. Atkins complained of the degraded whites of some of the prints he had recently made by this process.

Mr. Twigge showed some specimens of his work with the sepia toned paper, and detailed his difficulties in working it satisfactorily.

The exhibits of the evening were:—Prints coloured by the new Cundall process; a number of 15 by 12 enlargements, and a volume of views in England, Ireland, and Wales, by Mr. Beer; views in Wales, by Mr. Ellerbeck; stellar negatives and prints, by the Rev. T. E. Espin; a series of enlargements, by Mr. Cornish; and some home-portraits on opal, by Mr. Twigge.

The meeting, which was a very crowded one, was then adjourned.

Amateur Photographic Association.

The annual meeting of the Council was held on Tuesday, the 28th of October, at York Place, Portman Square; Dr. Arthur Farre, M.A., in the chair.

The minutes of the last meeting having been read and confirmed, the following members were elected:—Professor Butler, M.A., Sir H. Hussey Vivian, Bart., H. H. Williamson, F.R.A.S., J. J. Brown, Miss Mary Egerton, Miss Maude Sullivan, John Hanmer, F. Trimmer, M.R.C.S., J. E. Dumont, F. Grant, Mrs. Hobson, W. E. Pickels, F.R.M.S., &c., D. B. Fraser, and F. J. Double.

The Secretary then laid before the meeting the pictures for the current year, and Mr. Glaisher having carefully examined every picture, read his report.

The following prizes were awarded:—The 1st prize to R. Leventhorpe (107, 111, and 114), a large silver goblet; 2nd prize to R. B. White (2, 7, and 15), a silver goblet; W. Muller (1005-1019, and 1020), a water-colour drawing in frame; R. O. Milne (8 and 9), a silver goblet; H. E. White (1 and 2), a silver goblet; F. S. Schwabe (3 and 5), an oil painting in frame; W. S. Hobson (305 and 310), an elegantly bound album; C. Stephens (59, 60, and 65), an elegantly bound album; S. Norman (6-9 and 11), a silver goblet; W. Adcock (2 and 4), an elegantly bound album; W. D. James (14 and 15), a water-colour drawing in frame; W. Vanner (74-77, and 80), a water-colour drawing in frame.

Certificates of Honourable Mention were awarded to Lord de Ros, A. D. Halford, T. Brownrigg, General Sladen, A. Hill, Rev. H. Palmer, F. Beasley, G. Brook, A. Tagliaferro, G. R. Fludder, P. H. Emerson, and H. R. Moiser.

North Staffordshire Amateur Photographic Association.—A meeting was held on Wednesday, 31st ult., at the Mechanics' Institute, Hanley; Mr. Charles Alfieri occupying the chair.

It was resolved that a presentation print (10 by 8) should be given to each member of the Society, at the annual meeting, held in November, the Secretary being instructed to advertise for the same. A paper (with demonstration) on the "Carbon Process for Amateurs," was read by Mr. W. B. Allison. After some interesting discussion thereon, and the election of Mr. G. C. Bradford as a member, the meeting was adjourned.

Talk in the Studio.

Photographic Society of Great Britain.—The first ordinary meeting of this Society for the session will take place on Tuesday next, November 11th, in the Exhibition Gallery, 5a, Pall Mall East, when the medals awarded will be presented; and short papers read by Arnold Spiller, on "Hydroxylamine used as a developing agent," and by Captain Abney, R.E., F.R.S., on "The Siemens' Unit Lamp applied to photography."

The Ferrocyanide Developer.—Mr. F. C. Beach, of New York, writes as follows:—"For gelatine plates Mr. Newton has just given me a formula which was used on collodio-bromide plates. He finds it is excellent for instantaneous work on gelatine plates. I saw the negative to-day. *Developer*.—Water, 1 ounce; carbonate of soda, 50 grains; yellow prussiate potash, 50 grains; sulphite soda, 15 grains. To developer add 1 ounce of above, and 6 grains dry pyro to 1 ounce of water. I shall experiment with it further with sulphurous acid and with carb. of pot. in place of soda."

Northampton Museum Photographic Exhibition.—The following gentlemen will act as jurors:—Messrs. Andrew Pringle, Wm. Bedford, W. Blanchard (photographers); Mr. Joseph Clark (member of the Institute of Painters in Oil Colours); and Mr. G. W. H. Brogden (the representative of the local Society). We learn that the Exhibition will be opened on Tuesday, Dec. 16th, and not 15th, as previously announced.

Canvassing for Orders.—On Saturday last a respectable-looking man, who described himself as a canvasser in the employ of the Temple Photographic Gallery, 170, Fleet Street, was charged at the Southwark Police Court with obtaining the sum of 5s. 6d. from Catherine Evans, a widow, by means of false and fraudulent pretences. The alleged false representation was that the prisoner came from the Photographic Gallery, Temple Bar, and asked prosecutrix if she wished to have her late husband's photograph enlarged, like one he showed her. She gave him a likeness of her son's to get done, and 5s. 6d. He promised to bring it back in a week. The prisoner, in defence, said he handed the portrait and money to a young man, who said he was in the employ of the Gallery, and he thought it would be done. Mr. Slade committed him for trial. On the same day William Cobbett was charged at the Borough Police Court with obtaining money by false pretences from his employer, Mr. E. Hibling. Prosecutor, who is a photographer, engaged prisoner to canvas for orders for photographs on commission. He gave in the names of several persons to his employer with fictitious orders, and received his commission. It was proved that many of the orders were false, and prisoner was committed for trial at the Borough Quarter Sessions.

An Assault with the Camera.—At the Nottingham County Court, on Thursday, the 30th ult., John Thomas Cant, a detective of the borough, was sued by James Wafer for a technical assault committed in forcing the plaintiff to be photographed against his will. Plaintiff was at the police-station on remand on a charge of embezzling, but the magistrates subsequently discharged him, and while there a portrait was taken of him, which was circulated. His Honour held that the officer had exceeded his duty, and gave judgement for the plaintiff for 20s.

Obituary.—Just as we are going to press, we learn, with regret, of the death of Mr. J. Hubbard, of Oxford Street, who has for many years maintained a well-deserved repute for his negative and retouching varnishes. Mr. Hubbard was well-known to and respected by a generation of photographers and dealers whose ranks have been much thinned during the last year or two.

Photographic Club.—The subject for discussion at the next meeting of this Club will be "On Emulsions in Collodion."

To Correspondents.

*** We cannot undertake to return rejected communications.

P. H. E.—1. The hyposulphite was not added to the developer, but before the plates were developed they were immersed for a few seconds in a solution made by dissolving one part of hyposulphite in one thousand parts of water. After this treatment, and before development, they were rinsed in water. 2. It matters very much, and it is the business of the optician to put the slit in the right place, the chances being very much against you if you attempt to make any improvement by alteration.

A. C. A.—1. The "working up" is by no means essential, and *better portraits* can be made without it than with. Still, one must admit that *better pictures* can often be made by skilful working upon the photograph. 2. This query is almost answered by our reply to the first, as any method which will faithfully reproduce the original will serve well; but unless you have an exceptionally large apparatus, the originals will have to be enlarged. 3. Here again all depends on the quality of the original picture. 4. Not always; but if any inequality of illumination is noticed, you should try if any improvement results from using the ground glass screen. To determine whether it should be used, it is generally sufficient to look at the image on the focussing screen. The most successful enlargers have no invariable rule, but are guided by circumstances.

Photo.—Your sensitizing bath is not strong enough to thoroughly coagulate the albumen; add more silver to the solution, or obtain another sample of paper.

J. Robinson.—There is too much water; make it up with half the quantity.

A. G. B.—When you have had more experience with the method, you will, we hope, let us have full particulars. Thank you for the samples of paper; the German sample has certainly a magnificent surface. It is difficult to see why a thicker layer should be required on paper than on glass. The first picture one may call a composition, as the whole of the subject was arranged and taken in the camera at one operation, but the latter is a *combination* of several compositions. It is evident that retouching has been resorted to in order to modify the contradictions of lighting which would otherwise be noticable; but this has not been carried to excess.

Henry.—A mixture of starch paste and lampblack. Apply it with a small piece of sponge attached to a stick.

Y. E.—Rub it over with a solution of bees-wax in benzole, the mixture being applied with a piece of flannel.

C. E. W.—It seems to us as if the paper itself contains some impurity capable of reducing the silver salts, and this may be due to accidental contamination after the manipulation.

H. P.—We thank you in anticipation.

Lantern.—Formulæ have been given in the News, but we shall shortly have a few special articles on the subject.

A. Sargeant.—The competition did not take place for want of entries; but we may safely say that we have not seen anything of the kind superior to the examples you send us.

J. P. T.—We have no doubt that it will be received and appreciated. Address it simply to the Secretary.

Wm. S. Honey.—It is very ingenious, and we think that tin-plate is a more suitable material than zinc.

O. P.—A very good way is to obtain a list from a Directory, and to write to them individually; but many persons would prefer to advertise in the usual channels.

J. Howson.—It will give us great pleasure to see your invention, and to give an opinion as regards the matter you refer to.

Chas. Bristow.—1. As far as our knowledge goes, the gentleman referred to still resides at the same place; that is to say, we have not heard of his removal. 2. It is rather a stain than a paint, but will not answer very well, as it fades rapidly on exposure to light. 3. There must be some mistake. We have heard of persons using it to remove acidity; but it is certainly not soluble enough for the purpose named. 4. Dissolve it in alcohol. 5. Yes, but you must not add too much; half-a-grain to each ounce is quite enough.

The Photographic News.

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VENETIAN BOATS.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1367.—*November* 14, 1884.

CONTENTS.

HYDROXYLAMINE.

Now that hydroxylamine has been suggested as a developing agent for gelatino-bromide films, it may prove interesting to our readers to describe the preparation of the compound, and some of its reactions.

Lossen discovered it when examining the reduction of nitric acid by metals. The discoverer prepared the substance by reducing nitric ether with tin in the presence of hydrochloric acid. Convenient proportions are five parts nitric ether, twelve parts tin, and fifty parts of hydrochloric acid (sp. gr. 1·14). The mixture at first becomes hot, and when the action is finished, the alcohol, produced by the reduction, is distilled off. The dissolved tin is then precipitated with sulphuretted hydrogen, the solution evaporated to dryness, and then the hydroxylamine, as hydrochlorate, is extracted with absolute alcohol. Thus the compounds actually used up in the manufacture are only hydrochloric acid, nitric acid, and tin, for the alcohol used in the preparation of the ether is regenerated in the reduction, and recovered by the process of distillation. Unfortunately, when employing the above method, a certain proportion of the hydroxylamine is converted into ammonia, and thus nothing like a theoretical yield is obtained.

In a recent issue of the *Journal of the Chemical Society*, Dr. Divers describes a series of experiments on the production of hydroxylamine from nitric acid and various metals without the presence of alcohol. In one experiment with tin, nitric acid, and hydrochloric acid, no less than 98 per cent. of the theoretical yield was obtained. Fuming hydrochloric acid 58 c.c., and nitric acid—sp. gr. 1.42—5 c.c. were mixed, and poured upon 35 grams of tin lying in a flask filled with carbonic acid gas to exclude air. The corked flask was cooled by well agitating in water. When the action had ceased the solution was poured off, the tin precipitated as described above, and the substance obtained by extraction with alcohol. Victor Meyer has proposed the use of carbonate of soda as a precipitant of tin in place of the inconvenient sulphuretted hydrogen treatment. The liquor containing the tin is treated with the carbonate solution till no further precipitate of the tin compound takes place; the solution is then evaporated and treated with alcohol as described above.

Hydroxylamine exhibits both oxidizing and reducing properties. Its power of developing, and also the production of the red-brown deposit of cuprous oxide, when treated with ammonio-tartrate of copper, may be given, as an example of its reducing properties. Quite recently, in the *Bulletin de Mulhouse*, M. Schaeffer has proposed to apply hydroxylamine for printing. On treating a manganese brown with the hydrochlorate, the manganese is at once reduced to the soluble manganese chloride. A dark indigo blue dyed on manganese is lowered to a lighter and brighter blue by the action of hydroxylamine.

In conclusion, we may remark that the *Société Industrielle de Mulhouse*, in consideration of the many uses to which hydroxylamine might be applied, has offered a silver medal for a cheap method for its preparation.

VENETIAN BOATS BY ROBINSON AND THOMPSON.

An exhibition picture which has neither been honoured with a medal, nor very much noticed by the press, forms our supplement this week; but had the judges consisted exclusively of artists, we fancy that the "Venetian Boats" of Messrs. Robinson and Thompson would have taken high honours. It neither demonstrates the speed of the plate, nor does it illustrate in a striking manner the capabilities of any one quick shutter; indeed, we hardly think that we could find about it the text for any kind of a sermon upon the technics of the photographer's art. Still it has qualities which might well serve for numerous discourses upon artistic principles as applied to the work of the photographer. The picture very forcibly recals a study by Turner, and the slight mistiness of the atmosphere at the time the exposure was made, adds much to the pictorial value of the view, this mistiness being just sufficient to prevent an undue clearness or sharpness in the middle distances. Just to the left of the principal group of sails will be noticed the bell-tower of the great Church of St. Mark, and other monuments of the city of Venice are recognizable through the mist. The photograph, Mr. Thompson informs us, was taken on the brightest and clearest day out of five dull ones, and we may confidently assert that had it been taken on the clearest day out of five fine days, its merits would have been less.

LANTERN SLIDES.

Sixth Article.*

Collodion Emulsions with Excess of Silver.—The formulæ for collodion emulsions would be incomplete if no allusion was made to the method of producing emulsions with an excess of silver. It is not necessary to go very minutely into this, further than to say that if the reader will take either of the formulæ given, and especially that upon page 402, and calculate the equivalents so as to have two or three grains of free nitrate of silver per ounce of emulsion, and proceed in every other respect as indicated in the last article, an emulsion will be produced whose properties and qualities will be considerably altered. Under ordinary circumstances, a

* Reference to previous articles, vol. xxvii., pages 129, 291, 482, and 818; vol. xxvii., page 401.

collodion emulsion made with free silver will give fog unless restrained by a free acid, preferably nitric, in the proportion of about one minim per ounce of emulsion. Such an emulsion will ripen quickly, be very sensitive, undergo rapid change, and ultimately give thin and foggy pictures. Hence it follows that when such an emulsion arrives at its best, if it cannot at once be used up in making slides, it should forthwith be poured out into an earthenware dish, and allowed to set. If the dish be placed in the drying box used for drying gelatine plates, the draught will carry away the alcohol and ether more rapidly, and the emulsion will be safe from fog by white light. The next step, after evaporating the solvents, will be to strip the cake from the dish and tear it up into small bits, or cut it up with a sharp paper or silver fruit knife, and place all the pieces in any convenient jar or washing arrangement, where either a continual stream can be left on to effect the washing, or else whereby repeated changes of water can be given. The effluent water can be tasted, or otherwise tested to ascertain when all the free silver is out. Lukewarm water may be used for washing, but not recommended except by the experienced emulsion maker. In any case the waste salts have to be thoroughly got rid of as well as the nitrate of silver, otherwise the emulsion will be very insensitive, and will not keep when redissolved. With a gentle running stream through a washing jar about twelve hours should be ample, if the cake of emulsion was evaporated down to less than an eighth of an inch in thickness. When washing is complete, the pieces may be collected by hand and drained on a clean towel, or between blotting-paper, and afterwards dried at a temperature below boiling water, until it has parted with all its moisture, when it may be put into a bottle for future use, labelled "Washed Collodion Emulsion Pellicle."

To use this pellicle, we simply weigh out quantities at the rate of 20 or 22, or at the utmost 24 grains per ounce of solvents. It is best to use absolute alcohol and best methylated ether, equal parts of each, say four ounces of each, put into a suitable bottle, and 160 grains of pellicle; the whole shaken until solution takes place, and a plate coated, which will show the substance of the film. If more density be desired, add 16 grains more, and so on. When satisfactory, the whole should be filtered through a plug of cotton-wool stuffed into the neck of a funnel.

By any of the formulæ now given for collodion emulsion, good prints can be made for the lantern from negatives to be photographed in the camera as explained at page 291 of the last volume. The procedure is essentially different whether we use an unwashed or a washed emulsion. For rapidity of working we should incline to the use of the emulsion unwashed, if it can be used up in a day or two; this obviates all the labour and cost of washing and redissolving. The method is as follows:—We use nothing but quarter-plate glasses selected thin. Out of a small tin biscuit box a washing trough was constructed by fixing some gutta-percha grooving inside, which enabled us to place nearly two dozen plates therein. A tube was fixed in bottom at one end, and an overflow near top at opposite end. A short piece of rubber tube connected the water which entered at bottom and overflowed at top of box; a tin lid made the whole safe. The water being turned on into the box, we commenced by coating our glasses with the unwashed emulsion, and taking care to coat up into each corner, by doing which a substratum may be dispensed with. As each glass is coated and set, it is dropped into a groove in the box, back of glass towards the stream of water entering. We pour from one bottle of emulsion, and drain off into another—this avoids dust being poured off and on. When the draining bottle is replete, we filter its contents, and use it next time as the pouring-on bottle. There is a certain knack in coating plates with collodion emulsion, differing from either collodion simply, or gelatine. In order to avoid lines and unequal thickness, a pool has to be poured on, and then dexterously off, the exact manner of which comes by practice.

By the time the last glass for the washing-box is coated, and the bottles put safely aside, the first plate will be ready for exposure if the water has been left gently flowing through the box the while. Take out the first plate, and rinse it with fresh water, stand up to drain for a minute, and wipe off the back all moisture; then place it in the dark slide, and take to the copying camera. Make the exposure—which is a matter only determinable by experiment—return to the dark room, and proceed to develop with alkaline pyro, as per the formula in the last article. Carbonate of ammonia is preferable to liquor ammonia in developing collodion emulsion plates. The image should appear directly, and if the exposure has been right, the requisite density and vigour will be attained before any surface fog has time to set in. It is very important to see to this, because if once the plate is fogged, all further chance of making a good slide of it is lost. The exposure is bound to be sufficient in order to get vigour enough in the shadows, without which the resulting slide will be poor and thin when put on the screen. Under-exposure upon a plate not prone to fog will give a harsh black-and-white picture. Over-exposure is liable to result in a veil if the shadows are not rendered thin also. There is one correct exposure which the experimenter should find out, not overlooking the fact that a normal exposure with a good light will give a better result than an abnormal exposure with a poor light, and a lens which will work with a tolerably wide aperture is preferable to one which needs to be closely stopped down.

The foregoing refers to the use of an unwashed emulsion, the plates treated wet. To employ a washed emulsion, and also work the plates wet, we have merely to coat our glasses, preferably using a substratum, immerse them in the washing-box, in this case only to free them from the alcohol and ether, and proceed exactly as above directed for exposure and development.

To use plates for contact printing, we are compelled to employ dry films, and even in camera printing there are some reasons why dried films should be preferred. One person could be preparing the plates, and racking them when dry in grooved plate-boxes for use immediately by another operator, or for use at some future time by the person who prepares them. The amateur could clean, and coat, and dry a batch of plates—in fact, use up that particular lot of emulsion—say, one evening or on a wet day, and keep them until the first bright day or other convenient opportunity presented itself. To dry the plates some little care is required to avoid the wavy surface marks which appear whenever and as often as the drying is stopped. Perhaps the most certain way is to dry upon a tin or zinc box containing hot water; they then dry off at once, and can be put into plate-boxes out of the way.

To expose these dried plates, one is taken from the plate-box and put in the dark slide and exposed dry. Then before development the plate must be soaked in a weak alcoholic wash—alcohol 1, water 2 parts; this is necessary to penetrate the film, otherwise the development will be very slow, and the result weak and thin. Development is the same as for the undried plates.

Fixing can be done with weak cyanide, but is usually effected by hypo, followed by plentiful washing.

We have purposely avoided introducing any organifiers or preservatives in the compounding of these emulsions, for the certain reason that such are almost sure to lead to spots and other blemishes on the films sooner or later. From one point of view, organic or preservative agents are of value, inasmuch as they tend rather towards the development of a reddish image, and this is desirable; but we should prefer to obtain a reddish image without the preservative by the introduction of chloride into the emulsion, or altering the exposure and developer to bring about that object.

We have likewise abstained from introducing iron as a developer, because it tends rather towards a cold grey class

of image, whereas the same plate if developed by pyro will probably give a warm-toned image.

If we can develop a red image, we can afterwards tone it by platinum to any tone we like up to actual blue, but the medium, purple, a compound of the red and blue, will be found most liked. The method of toning by platinum was given under the head of wet plates.

With all kinds of collodion emulsion plates there is frequently a very slight surface deposit which can be removed by very weak nitric acid, a few drops per ounce of water, without fear of injuring the image or the tone.

The production of lantern slides by means of collodion emulsion, either wet or dry, is a really enjoyable occupation, which we commend to our readers whilst the present fine weather lasts.

THE NEWCASTLE-ON-TYNE PHOTOGRAPHIC EXHIBITION.

This exhibition of photographs by members was opened on Tuesday last in the Central Exchange Art Gallery, and an excellent show of work is on view. The Judges are Col. Sheppee, Mr. W. Cozens Way, and Mr. P. M. Laws. The silver medal for the best series of three pictures taken by a member at the Society's out-door meetings was awarded to Mr. Gibson, of Hexham, while the prize for the best two pictures taken at the out-door meetings was given to Mr. Goold. The exhibition will remain open until the 18th instant.

The Society's presentation print is to be selected by the whole body of members voting for the picture or pictures most pleasing to themselves; and on the last night of the exhibition scrutineers will be appointed to examine the voting papers.

Among the pictures especially worthy of mention are the medal photographs of Mr. Gibson, No. 8, "Blasted Oak, Staward," and No. 11, "On the Allen Staward;" both fine examples of out-door work. Mr. Goold's prize views of Dilston and Bywell (Nos. 19 and 20) are also exceptionally meritorious. Platinotype printing is well represented by Mr. Dodd, and such workers as this gentlemen will do much to make the process popular; but one must not omit to mention that Mr. W. J. Robinson, jun., also sends an admirable collection of platinotype pictures. Mr. Proctor (who shows a view taken without a lens), Mr. Templeton, Mr. Galloway, Mr. Stevenson, Mr. Borrow, Mr. Balsdon, Mr. Anty, and Mr. Pike, all deserve honourable mention; and the views on the Allen by the last named gentleman were much admired.

THE PALL MALL EXHIBITION.

Final Notice.

Some pictures not hitherto mentioned call for notice, and prominent among these may be mentioned Mr. W. England's unrivalled views of Switzerland (No. 297). Mr. T. Scotton, of Derby, sends a good example of the kind of work he habitually does for the Midland Railway Company, the picture in question (No. 298) being a side view of an express engine. One cannot help thinking that the company should have all such subjects printed in carbon or platinotype. The best picture of several contributed by Mr. Lyddell Sawyer is, undoubtedly, No. 345, "The Three Fishers," which shows three lads fishing from a large trunk placed bridge-fashion across the stream. "The Unfamiliar Tune" of Mr. Edwin Smithlls shows us a violinist who is, evidently not quite used to playing at sight, and the somewhat embarrassed expression is admirably caught. A magnificient sea study (No. 470) by W. P. Marsh is, to our mind, a little marred by the cold inky tone in which the enlargement is printed. Mr. E. Cocking, the Assistant Secretary of the Society, shows some admirable reproductions of oil paintings, and he is to be complimented on his success in this exceptionally difficult branch of photography. We now give a Meisenbach block of a picture in the "medal" frame of Mr. Taglia-

ferro; it shows the monument erected to the memory o Emanuel Pinto, the celebrated Grand Master of the Knights of Malta. The monument is in a side chapel of the great Church of St. John, and is built of marble and mosaic. Even in the present day the coins of Pinto are occasionally met with in Maltese currency, and they all bear the arms shown on the base of the monument.

COLOURING MATTERS AS OPTICAL SENSITIZERS.

BY DR. J. M. EDER.

I have made experiments with a great number of red, green, and yellow colouring matters, in order to determine their action on gelatino-bromide films as optical sensitizers. Each of the following colouring matters was found to exercise a sensitizing action quite in accordance with the absorbtion spectrum obtained by the transmission of light through a dry film of gelatine coloured with the dye, and

all of those mentioned are sensitizers for the extreme red rays of the solar spectrum. Iodine green, bromeosine, iodeosine, erythrosin, pyrosin, aureosine, ethyleosine, methyleosine, phloxin, rose-Bengal, gyanosin, hydrochlorate of rosaniline, acetate of rosaniline, Coupier's tolnidine-red, bitter-almond-oil green, brilliant green, methyl green, picrate of methyl-green, aldehyde green, Hoffman's violet, dahlia, methyl violet, Paris violet, benzyl-rosaniline violet, gentian violet B, gentian violet B R, resorcin blue, fluorescin, iodcyanine, chlor-cyanine, cyanine sulphate, cyanine nitrate, Coupier's blue, red corailine, naphthaline red.

The following gave no absorption bands, but a gradual action towards the red (often, however, scarcely recognizable):—Carthamine, turmeric, hematoxyline, the same with ammonia, soluble Prussian blue, hydrochlorate of monophenylrosaniline.

Coloured gelatino-chloride of silver films gave the maximum of action in the yellow, and in the same place as with a gelatino-bromide film.

I have taken photographs of oil paintings (under yellow glass) on plates prepared with the above colouring matters, and have found the colour-scale of the paintings to be correctly reproduced. Such plates I call "orthochromatic" plates, as the term "isochromatic" is used to designate the special plates of Clayton, in Paris; and, moreover, the term "isochromatic" is used in quite a different sense in optics.

At Home.

WITH MR. H. N. WHITE: MAKING VITRIFIED PHOTOGRAPHS.

MR. RANDS, the manager of the Ceramic Stained Glass and Vitrified Stained Glass Company, looks rather surprised when we call at 19, Finsbury Circus, and tell him we have come to see how the enamel photographs are made. "The works," he says, "are at Chingford—we have only show rooms and offices here; and I really don't know anything at all about your seeing the factory; but let me show you what we have here."

Almost every branch of photography executed in vitrifiable colours was represented in the show rooms, as the bulk of the work is done to order from the negatives or prints of customers, and the greater part of the pictures were either made on glass, or on articles of crockery, such as plates or dishes. There were, it is true, a good many photographs which had been vitrified on square earthern quarries, like the well-known Dutch tiles, but, as far as we could gather, the public taste does not run so much on these as on ordinary plates and dishes decorated with photographs, or on transparencies for the window. Vitrified pictures are, Mr. Rands told us, coming much into use for placing on graves and mounting in tombstones, an application of them which has been common on the Continent for some years.

Our inspection of the show-rooms is soon over, and notwithstanding the fact that the manager is by no means certain that we can be admitted to the works, he is good enough to accompany us to Chingford by the next train.

The clean bright little village—or, maybe, it is a town—being reached, we turn down a private road with a row of cottages on one side and a meadow on the other, the last two cottages forming part of the works. Mr. White, whom we had never seen before, receives us with a hearty welcome, and at once promises to show everything; also to tell everything with two exceptions.

The establishment hardly corresponds to the general notion of a "works" or factory, as the cottages are comfortably-fitted up in the ordinary house fashion, and are principally occupied by young ladies who are engaged in retouching, painting diapers or borders, and colouring the ceramic pictures. At the back of the cottages is a field, of which a part is laid out as a garden, and beyond the garden beds are three studio-like buildings of wood and glass, while on one side, and as much out of the way as possible, is the stove or furnace where the firing is done.

It is the dusting-on process which Mr. White adopts, and he first took us into the studio-like building where the sensitive plates are prepared, upon which the enamel colour is dusted; and it does not follow by any means that the glass or porcelain first coated with the sensitive mixture is that upon which the enamel is finally vitrified, as it is quite easy to transfer the dusted image to a new glass or tile. If, however, the image is to be transferred, the glass should be collodionized and allowed to dry before the application of the sensitive mixture. The exact composition of the sensitive preparation used by Mr. White is one of those two things which he keeps to himself, but we know that the mixture recommended for this purpose in Dr. Liesegang's "Handbook of Photographic Enamelling"* answers very well, so we will give it here:—

Water	...	...	...	100 parts
Moist sugar	...	...	...	10 ,,
Gum-arabic	...	...	...	10 ,,
Bichromate of ammonium			...	4 ,,

The glass, very carefully cleaned and (collodionized if the image is to be transferred), is now placed on a levelling-stand, flooded with the sensitive mixture, and after the composition has been allowed to remain on for a few seconds, the excess is drained off, the plate being now dried in an inclined position. The drying cupboard is contained in the "dark"—or rather, yellow-lighted—portion of the building; but no doors separate the dark-room from the rest, the entry of white light being prevented by hangings of haize arranged on the baffle-plate principle, so that one can walk in or out of the yellow room without touching or disturbing the hangings. The warm cupboard stands on a tin water vessel, scarcely two inches deep, and about two feet wide by five feet long, the whole being closed, excepting that a pipe is provided, by which any vapour may escape. The wooden bottom of the drying-box stands directly upon the top of the hot-plate or water-bath, and the front of the box is merely closed by means of a curtain. As the plates are coated, they are reared up on edge in the cupboard, and allowed to remain until quite dry, when they are ready for exposure in the printing-frame. Mr. White tells us that much depends upon care in drying, and that many fail in the working of the dusting-on process through drying the plates at too high a temperature; indeed, he tells us that in warm weather he very often uses no artificial heat at all. "What is the temperature in the cupboard now?" we ask; but Mr. White confesses that he has no idea of the temperature in degrees. To the hand the interior of the drying-box seems only a trifle warmer than the external air, and one may perhaps estimate it at about 85° Fahrenheit. The large flat water-bath or hot plate upon which the cupboard stands is kept sufficiently warm by one paraffin heater with a four-inch wick, and turned down very low. "The special advantage of the hot water plate is that it ensures a uniform heat all through the bath," says Mr. White; and once more he takes the opportunity of impressing upon us the fact that very little overheating is fatal, as it bakes the mixture, and renders it incapable of again absorbing moisture.

The exposure is made under a transparent positive, and the greatest care is exercised to see that printing frames and transparencies are perfectly dry; indeed, it is generally considered advisable even to slightly warm them before use. More than this, Mr. White called our attention to an apparatus somewhat resembling a gardener's forcing frame, and provided with a heating arrangement consisting of a battery of paraffin lamps. "This is where the printing frames are placed during damp weather," Mr. White said; "and without some such arrangement for keeping them

* *Photographische Schmelzfarbenbilder.* Ed. Liesegang, Dusseldorf.

perfectly dry, our work would be very uncertain." The exposure required is not a very prolonged one, a single minute in bright sunshine being often sufficient, while in dull daylight half-an-hour or more may be required. No actinometer is used, it being easy for one who is constantly at the work to judge the exposures with sufficient accuracy. The effect of exposure to light is to destroy the power of absorbing moisture which the sugar and gum ordinarily possess, consequently when the plate is withdrawn from the printing frame and exposed to damp air for a few minutes, those portions which have been protected from the action of the light will hold the vitrifiable pigment which is now dusted over the plate, while the most exposed parts refuse to take up any pigment, because they do not become adhesive by the absorption of water. For dusting with the vitrifiable pigment—which is just such a powder colour as potters use in decorating their goods—the plate is laid in a tin dish, and the powder is dusted over with a broad camel's-hair brush. If the image is very slow to appear, one may venture to breathe very cautiously on the plate, after which the enamel colour is again applied. A little consideration will show that in this process over-exposure results in a hard image, while fog or general tinting is a consequence of under-exposure. When a perfect picture, having all the gradations of the original, is obtained, the excess of pigment is brushed off, and the powder colour is fixed by flowing collodion over the plate. If the plate were now fired, the chromium compounds in the film would become vitrified, and would give a disagreeable green tint to the picture, so some means of ensuring their removal must be adopted.

One of Mr. White's secrets is the composition of the fluid in which he soaks the plates at this stage to remove the chromium; but Dr. Liesegang recommends soaking for half-an-hour or so in a two per cent. solution of caustic potash. The preparation used by Mr. White for the removal of the chromium is contained in the largest collection of glass dipping baths which we ever before saw in one place; we counted eighty all placed in a compact row one behind the other, and then gave up the task, as we observed other such rows on another part of the table. The chromium having been removed, and the plate dried, all is ready for the final operation in the furnace, if the vitrification is to take place on the original support; but if the film is to be transferred, the plate must be allowed to remain in very dilute acid (say, one part of nitric acid in sixty or eighty of water) until the film can be floated off, and placed in position on the glass or tile which is to be decorated.

As we leave the place where the dusting work is done, we meet an inventive friend of Mr. White, who has just come to tell him that he has discovered a new use for vitrified photographs. "See here," he says, as he fastens to the door of the room a tile bearing a group photograph; "let these portraits be those of the persons employed in the establishment; you mount this upon the door, and when any one goes out you cover him up with a kind of shield hinged on a wire thus." This suggestion of the "funny man" not only makes Mr. White smile, but it serves as a text for him to explain his views as to the future of ceramic photography. Mr. White, we may remark, is an enthusiast, and he looks on the burnt-in picture as the photograph of the future. He tells us that pictures on glass need not cost so much as to prevent their general use for window decoration. Not only can you make an album of your drawing-room window, but it may be an art gallery as well, decorated with reproductions of the choicest engravings and paintings; while your library windows may be adorned with portraits of all the great masters in letters.

We have now reached the furnace room, and as we enter we see a row of four cast iron muffles along the side opposite to the door and windows. No coal is visible, and for a moment we fancy that the furnace must be fed with gas made on the Seimens system; but no, Mr. White tells us that he is sorry to say that he uses coal, but in order to minimise the inconvenience from its use, he has arranged for all the feed places of the furnaces to be outside and at the back. Wood is, according to Mr. White, the only solid fuel which is quite satisfactory, as this alone is free from sulphur; and he hopes to secure a good supply when the lopping season commences in Epping Forest.

Three of the muffles are large ones, and each has runners for taking twelve iron plates, each of these plates being large enough to carry a square of glass thirteen inches square. The muffles are red hot, and Mr. White is about to fire some plates, but his first step is to draw down the blinds—which, by-the-bye, are black—and to make the room darker than many a so-called "dark room." "This is to enable me to judge of the heat," explains Mr. White; and he says that it would be quite impossible to form any notion if daylight were admitted. Each plate to be fired, whether porcelain or glass, lies on an even bed of whiting, about a quarter of an inch thick, this whiting being spread on the cast iron plates that slide into the muffles, and in every case the bed of whiting is carefully levelled by means of a thick slab of plate glass provided with a handle. To put the iron plates bearing the sheets of glass directly in the hot muffle would be quite out of the question, so Mr. White has arranged a set of paraffin stoves, one for each iron plate. All these are placed in a row, each one towards the left being turned up a little higher than its neighbour on the right. When an iron plate, with its bed of whiting and sheet of glass, has been heated to the full power of the first stove, it is moved to the next, and so on until it is sufficiently heated to be placed in the muffle without danger of fracture. When the muffle is fully charged, it is closed with a heavy iron door, upon which are two tubular pieces which project forwards and fit into corresponding openings in the outer door of the furnace. When this outer door is closed, the flames can circulate all round the muffle, but cannot reach the interior. Still, in the case of colour work, Mr. White finds mischief to result from the sulphur of the coal, so he has put himself to some pains to arrange for the ventilation of the muffles by means of tubes leading from the upper part into the open air. The firing does not take long, but the cooling is a slow process, as if the glass is rapidly cooled, it is so liable to break as to be useless; indeed, two charges a week, or at most three, are as much as can be fired if the plates are properly annealed.

Besides the three large cast-iron muffles, there is an experimental muffle, built up out of fire tiles, and in front of this hangs a framed sheet of glass, balanced sash-fashion by weights—a very necessary protection to the eyes during experimental work.

The photographic department is in one of the three glass-houses already referred to, and the first thing to attract our attention is one of Ottewell's old cameras for making large portraits direct, the lens being a Jamin of nearly seven inches diameter. Although the slide of this apparatus will take a 16 by 14 plate, it is in daily use for the smallest sizes. Mr. White is a little conservative in his notions: he holds strongly to the superior advantages of taking large portraits direct, and has only worked the gelatino-bromide process during the past few months: in pointing to his large bath, and the four half-gallons of solution required to charge it, he could not help expressing regret at keeping it to look at rather than to use.

The dark-room is at the other end of the glass-house, and is partitioned off by doors sliding in deep grooves, so that the whole length can be thrown into the studio if required—an excellent arrangement for those who may wish to work with lenses of long focus.

Outside the studio we find a number of ceramic pictures nailed up; and enquiring the reason why—"It is to test their power of resisting the weather," we are told; but in no case have they shown any indication of deterioration,

although they have been exposed for three years. Still, if a picture should not be sufficiently fired, or if the flux-colour contain too much lead, enamels will be liable to damage by exposure.

It should be mentioned that many of Mr. White's pictures are vitrified on opal glass, and he told us that the English flashed opal is the only material upon which he can depend, the foreign pot-opal melting completely at the temperature required for a proper vitrification of the colours.

Several medals have been awarded to Mr. White for his productions, among which may be mentioned those of the Edinburgh Art Society, and the Cornwall Polytechnic Society; while the Glass Sellers' Company has conferred upon him the honorary freedom of the Company, as well as its silver medal.

HINTS ON POSING AND THE MANAGEMENT OF THE SITTER.

BY H. P. ROBINSON.

CHAPTER 5.—FULL-LENGTH FIGURES.

THE full-length figure as a portrait has "gone out." When the carte-de-visite was introduced it assumed this well-known form, and a year or two elapsed before there was any change; then the head-vignette came in. Photographers stuck to these two forms, and resisted all attempts to add to them for a considerable time. Then the three-quarter figure was introduced, until we came to that monstrosity, the large head that nearly fills the whole space. This last form of card owed its origin to accident. A firm of photographers who possessed a very large stock of negatives of famous people—three-quarter figure, whole plate size—finding that the carte had quite spoilt the sale of their 8×6 portraits, conceived the idea of printing the heads and issuing them as cartes. The ignorant multitude, seeing that so many celebrated characters had had their portraits taken in this way, rushed to have their own done in the same style; and thus it is that even to this day we are sometimes obliged to do these out of proportion cards. Some of the earliest full-length cartes-de-visite were pictorial gems. They were done by masters of posing and picture-making. The art had not got into the hands of the trade then; prices had not fallen below the usual guinea; and photographers could afford to give a picture instead of a map. Cartes of that time by Disderi or Silvy are still beautiful in pose and effect. Then the art, as an art, fell upon evil times. It struck a photograph maker that "ten for ten shillings" would be a good cry to go to the public with; and it succeeded, commercially, for sitters followed like flocks of sheep. They were collected, after paying their money, in a room; a door was opened about every five minutes, and a sitter ordered through it into the studio, where he was fixed up against the head-rest (always ready), exposed, and shown through another door, and left to find his way down stairs. There was no thought given to variety of pose or light and shade; the only consideration was how to get the sitters through the studio fast enough. No proofs were submitted; the sitter had to be content with whatever the manufacturer chose to send him. In those days people were almost compelled against their will to carry their cartes in their pocket for the purposes of exchange, and many did not care for the quality of the portraits, so they could observe the "social custom" cheaper. This was scarcely fair to those who went to the best photographers and paid a good price; and people objected to exchange the beautiful little pictures by T. R. Williams, costing, perhaps, seven and sixpence each, for shilling failures, manufactured by a company.

But this is not a history, and I must return from this digression.

The full-length figure, then, is not so much in vogue as it was twenty-five years ago. It was never a favourite of mine for men's portraits, for I cannot be induced to take any interest in boots and trousers; but it was useful for ladies' portraits, especially when dresses were worn long; They were not so easily managed during the short-skirted period, and I am not sure that it was not the kind of dress that cheeked the full-length portraits. The declension of crinoline also was another check, for it was found difficult to fill up the cabinet form of picture with the thin figures that succeeded the monstrous balloon figures of a quarter of a century ago. The full-length is still useful, and will, I think, become more prevalent. It still affords the best way of showing gorgeous dresses, fancy costumes, and some portraits, such as those of girls between the age of nine and fifteen. There is a great difficulty in showing the age between these periods. A girl of thirteen or fourteen will often look much older in her portrait if some way is not taken to show that she is a young girl, such as showing that she is wearing a short frock, and here it is that the full-length is appropriate.

A full-length admits of a more florid treatment than any other style of picture. A more elaborate make up of the furniture and surroundings is permissible, and pictorial backgrounds may be employed. For ladies' portraits it admits of a greater variety of pose and effect, but it is not so easy to make a pleasing picture of the whole length of a gentleman; there does not appear to be enough of him to fill the picture, he is too long for his breadth, and he almost always looks stuck up to be shot at. Let us finish off the gentleman first, as he presents the greatest difficulty. The problem is, how to produce a full-length portrait of a man, so that he shall look like a gentleman at his ease, without a preposterous look of attempted dignity, self-consciousness, or defiant swagger, on the one hand, or feeble inanity on the other. This is often attempted, but seldom comes off. It is impossible to give rules and regulations in this case, and all that is left for me to do is to tell you what to avoid. If for a standing figure, get some idea of the posture you think would suit the case in hand and arrange the furniture so that it should lead, as it were, to the pose you require. Then get the model to stand in the place you have prepared for him, and instantly take advantage of all accidents. He may not go into the pose you had in your mind, but if he is not thinking intently on doing his best—which exercise of the faculties spoils half the portraits taken—he will perhaps assume a better. This you must seize at once. It will probably require some slight alterations, some slight turn of the head, or variation in the position of the arm. These are easily made, and can often be done without the model knowing much about it. For example, if you want him to raise his arm, with his hand on his hip, if you will assume this position yourself, you will find in most cases he will with unconscious imitation follow your lead. This will not occur to a blundering operator, one who does not seem to know his own mind; but the skilled operator appears to have a kind of magnetic influence on his sitter which is both curious and useful.

All I have said in the chapter on three-quarter lengths as to variety, movement, animation, &c., applies here, and need not be repeated; but in a full-length there is more scope for what may be called technical art than in any other form of portrait. There is room for the photographer to show his knowledge of composition, a subject into which I have entered fully in "Pictorial Effect" and "Picture-Making by Photography." The student has, I hope, read these little essays, and will know how to arrange his accessories so as to get balance, variety, and contrast.

To make good full-length portraits of ladies is a comparatively easy matter. They are nearly always picturesque in themselves, and, except when an insanity of ugliness seizes those who command the fashions, as it did when the order for wearing crinolettes was issued, this dress lends itself to the needs of the artist. Here again I have said,

in a former chapter, everything that is necessary regarding the arrangement of the figure, for what applies to the three-quarter will apply nearly to the full-length; but I might add here, what I think has been omitted before, that a lady should never be seated in a very low chair; however easy and natural it may look in life, it often results in the representation of a mere bundle of clothes in a photograph; and if a lady is seated in a high-backed chair it is well to avoid letting the back of the chair rise above each shoulder, which often produces the appearance of deformity.

It is difficult to say anything definite about the posing of ladies without taking the style of dress into consideration. We have just passed through a period of seven years distinguished as being the most picturesque and beautiful in regard to ladies' dress that the world has seen for centuries. Æstheticism, however it might be sneered at by the unthinking, or brought into contempt by its too enthusiastic votaries, did wonders for what is known as taste. The reaction that has come has been fortunately only partially successful. The tyrants who rule over fashion, for trade purposes, have perhaps for the first time in the world's history been partly defeated. They ordered that beauty shall be abolished for a season, and ugliness reign. The preposterous forms in which some women now appear is absurd. The curious thing is that they don't see it themselves, and laugh in each other's faces; but they don't even smile at one another. I have just photographed a short lady who, by the curious arrangement of her dress, looked so like a bantam that I almost expected her to crow!

But the reign of ugliness is only partly successful. There was a great revolt against the revolution never before known in the history of fashion. Women are now not the absolute slaves to the dictates of fashion that they have hitherto shown themselves to be throughout the ages. Some of them have been educated, and have learned that taste does not consist entirely in dressing to order to suit trade purposes. Therefore, some of them, chiefly the wives and daughters of artists, combined together and signed the pledge against crinolette! We owe it to this that there are still women to be seen who do not look ridiculous, and who can afford to stand for full-length portraits. In the old crinoline times a lady used to justify herself for her inflated appearance with the pretence, "I must not be singular." That excuse no longer holds. So many sensible women still cling to the good taste they have learnt during the interregnum of crinoline that there is no pretext for wearing it except absence of taste or a determination to blindly follow the dictates of fashion at all costs.

NOTES FROM NEW YORK.

Fall Lantern Exhibition by the New York Amateur Society.

The first fall lantern exhibition given by the Society of Amateur Photographers here occurred on the 30th inst., and, despite the inclement weather, was largely attended by many gentlemen and ladies.

Several interesting slides were exhibited, including views in the Colorado River, Candor, Arizona, mining districts, and the Cliff Dwellings in the same region, by Mr. R. Spaulding, an amateur of but two years' standing.

Other views, made on dry plates, of watering places near this city and the White Mountains, by Mr. Brush and Wright, were much admired. Slides of the World's Exhibition building, at New Orleans, La., were kindly contributed by Mr. Edward L. Wilson, of Philadelphia. Among those present was Mr. York, of Loudon, well-known for his manufacture of fine lantern slides. He promises to be present at a future meeting, and it is hoped that he will give a talk to the Society on the subject of lantern slides. I learn that he contemplates visiting Washington soon, and has thus far made some three hundred negatives, and has been as far north-west as Manitoba.

The entertainment was much enjoyed by the members and friends.—The New York Amateur.

New York, Oct. 31st, 1884.

MAKING AND DEVELOPMENT OF GELATINO-CHLORIDE PLATES.

BY T. BAYNTON.*

I must commence by stating that I am indebted to Mr. A. Cowan for the emulsion formula, and to Mr. B. J. Edwards for the developing formula, although I have made some slight alteration in them. The members will find that they can, with this kind of plate [sample transparencies from negatives taken during the summer were here passed round], make very beautiful lantern slides, and so amuse their friends and themselves at the same time on these dull winter evenings.

For the convenience of those members who wish to make their own emulsion plates, I will now give the formulæ. Those who do not care to be at this trouble, can obtain them from me if they like.

Silver	1 ounce
Water	10 ounces
Gelatine (hard)	1 ounce
Sodium chloride (pure)...	½ ,,
Water	10 ounces

Let the gelatine soak for a short time, and then dissolve by placing the vessel in water at about 110° F., and warm the silver to the same temperature. Now take into the dark-room, and mix by any of the well-known methods, so as to form a very fine emulsion. It may now be cooled by placing the containing vessel in running water, and when cold, wash, re-melt, filter, and coat in the usual way. Expose for five seconds (more or less, according to the density of the negative) to diffused daylight, and develop with—

No. 1.

Neutral oxalate of potash	2 ounces
Chloride of ammonium...	40 grains
Citric acid	2 drachms
Distilled water	20 ounces

No. 2.

Sulphate of iron	4 drachms
Alum	90 grains
Distilled water	20 ounces

Add one part of No. 2 to an equal part of No. 1, but do not reverse this by adding No. 1 to No. 2, or the result will not be so good. If the plate is properly exposed, the result will be a fine purple-black tone in the transparency. If you like a warm brown tone, expose double the time, and add an equal bulk of water to the developer. The development in this case will be much slower. Many different tones may be obtained by using the various developers given by Mr. Cowan. To fix the picture, use one part of hypo to eight parts of water. After fixing and washing, put the plates for half-a-minute in the following:—

Alum	1 ounce
Sulphuric acid	1 ,,
Water	20 ounces

This will dissolve the opalescence caused by the oxalate. The plate must now be well washed, dried, and varnished in the usual way.

Notes.

The Lord-Lieutenant of Ireland has promised to open the Exhibition of the Photographic Society of Ireland on Tuesday next, while both as regards quantity and quality the Exhibition is expected to be an exceptionally good one.

The awards are to be made by a method which is practi-

* Read before the Coventry and Midland Photographic Society.

cally identical with that suggested by Mr. Harry Pointer, in our issue of last week.

Mr. Common's labours in applying photography to astronomical research are very highly spoken of in the recently published Cantor lectures of Mr. Norman Lockyer. Speaking of the photograph which formed one of our supplements during the past year, Mr. Lockyer says:—"This photograph I consider to be one of the greatest achievements of modern astronomy, and I have taken occasion elsewhere to say what I believe to be perfectly true, that if all the human efforts which have been directed, so to speak, to this group of nebulæ in Orion for two-and-a-half centuries were put in one scale, and this photograph were put in the other, it would weigh them down; in fact, that sixty minutes of nature are worth two-and-a-half centuries of art."

The photographing of the treaty of Tientsin was announced as a novelty, but it turns out to be no novelty at all. Turning over the pages of the *Daguerreian Journal* for 1851, the other day, we came upon the following paragraph:—"We find in one of the foreign magazines for 1843 a notice of a curious application of photogenic drawing." It says, "We have just heard of a curious and interesting practical application of a recent scientific discovery, which will somewhat startle our readers. The Chinese treaty was copied by the photographic process of Mr. Fox Talbot, and the copy so made, for the sake of securing perfect accuracy, is now deposited among the State papers."

The President of the Photographic Society, speaking from the chair on Tuesday last, referred in glowing terms to the great prosperity of the Society; and as an illustration of this he mentioned the fact that there were no less than forty-three candidates for admission into the Society, a condition of things quite unprecedented.

That the Society is prospering there can be no doubt, and we heartily congratulate the President; still, the forty-three candidates must not be taken at par.

The charge of one shilling per foot for wall space at the Exhibition is not made to members of the Society, and, moreover, it is excused to those who may become members at the November meeting. In addition to this, those elected in November or December pay no subscription until the beginning of the following year. Out of the forty-three members elected on Tuesday last, twenty-five are exhibitors.

"Sixteen shillings an ounce was the price of pyrogallic acid when first I used it in photography; now it is nearer sixteen pence."

The above remark was made on Tuesday last by Mr. John Spiller in reply to a remark as to the impracticability of using hydroxylamine on account of its high price. One may not be wrong in expecting the reduction in price in hydroxylamine salts to be more rapid and more considerable than that which we have experienced in the case of pyrogallic acid.

One may expect that the Siemens unit lamp will come into general use as a working standard of light for the photographer, and from Abney's description we imagine that the cost of the apparatus need not be more than two shillings or half-a-crown. Indeed, an ordinary spirit lamp may be so adjusted as to serve very well.

Acetate of amyl (artificial essence of jargonelle pear) is not an extremely expensive fuel, considering that one is not likely to burn the lamp for a long time at a stretch. Perhaps the acetate may cost eight or ten shillings a pound.

It was hardly expected that the Pall Mall judges would make any awards for apparatus, but they did so at the eleventh hour, Mr. McKellen taking a medal for his excellently designed camera (see p. 703). This camera did not arrive till about a fortnight ago, the instrument which was originally prepared for exhibition having been inadvertently parted with.

Details given in our report on page 723, show that the Photographic Exhibition, which closed yesterday, was one of the most successful—if not the most successful—which has yet been held by the Photographic Society of Great Britain.

From Vienna we hear that isochromatic plates are being used for portraiture in the studio.

The uniform of a Captain in the Hungarian Cavalry presents such an array of bright colour as one rarely meets with, and to satisfactorily photograph one of these officers in uniform has been considered impracticable; but Herr Scolik says that when azaline plates are used, there is no difficulty, the red trousers showing lighter in the picture than the deep-blue portions of the uniform.

The Emperor of Germany has decorated Dr. H. W Vogel with the order of the Red-Eagle.

Badly as photography was represented at the Lord Mayor's Show on Monday, we are glad to say that the President of the Photographic Society and Mr. W. England were present at the banquet in the evening.

Unfavourable as the day was for instantaneous work with the camera, Mr. W. Cobb obtained a series of about half-a-dozen pictures on ten by eight plates, the exposures being made from a point near the west end of the Holborn Viaduct. Although the plates were exposed at three o'clock in the afternoon, and Mr. Cobb took them to Woolwich for development, he exhibited a transparency at the Pall Mall Gallery during the evening.

Half-a-dozen Meissenbach-block portraits, which are to

be found on p. 16 of *Cassell's Illustrated Almanack* for 1885 speak well for the future of the photographic block work as compared with wood engraving. To produce wood engravings of equal merit would certainly cost six or eight times as much as the price of the blocks. Mr. Heywood, of Manchester, also issues an almanac illustrated with Meisenbach block portraits.

The late Mr. E. Authony, of New York, encouraged photography in a very practical fashion. In 1851 he offered a prize of 500 dollars for the most important improvement in practical photography that should be effected during the year.

A novel exhibition, of which photography will form a part, is to be held in Bristol next February. It relates entirely to the industrial pursuits of women, the object of the promoters being to show the progress made by women who follow some line of work as a business. Amateurs, therefore, are ineligible. Lady photographers are not numerous, though we may expect to see the ranks extended now that ladies have begun to practise the art as amateurs; but there must be hosts of retouchers, colourists, mounters, and operatives engaged in the preparation of albumenised paper who are females. Of the hundreds of young ladies who are engaged in reception rooms we say nothing, as they scarcely come within the scope of the plan laid down by the promoters of the exhibition.

Nature tells us how the illuminated fountains at the Health Exhibition are made; arc lamps being used to project a cone of rays into the central portion of each stream of water as it issues from the jet; but the nature of the arrangement presents no features likely to be novel to attentive readers of the *Photographic News*.

The drawback of photographic albums is, that give what price you like for them, they *will* fall to pieces. We learn from the *Paper and Printing Trades' Journal* that some one has invented a flexible metal back, making what has hitherto been the weakest part of the book to become the strongest. The back is expanding, and the leaves can be added as required. Soiled leaves can also be replaced. If the album does all that is said of it, it will be a boon indeed.

Patent Intelligence.

Patent Sealed.

10,950. Alexander Henry Reed, 90, Cannon Street, London, Engineer, for "Certain improvements in photographic cameras."—A communication to him from abroad by Calvin Rae Smith, New York, United States, Artist.—Dated 5th August, 1884.

Specification Published during the Week.

4906. Arthur Fullerton Howman, George Street, Oxford, in the County of Oxford, Photographer, for "Dark slide for photographic cameras."—Dated 30th September, 1884.

A single dark slide in which the shutter is entirely withdrawn, the slot closing by a spring arrangement somewhat resembling that ordinarily used in America.

Reviews.

DE L'EFFECT ARTISTIQUE EN PHOTOGRAPHIE.

Par H. P. Robinson. (*Paris: Gauthier-Villars*).

Here we have a translation into French of Mr. Robinson's last book, the editing of the French edition having been excellently done by M. Hector Colard, of Brussels. To merely translate a book like that of Mr. Robinson is an impossibility, as he who endeavours to express such an author's meaning in another language must strive rather to write a new book embodying the sentiments of the original, than to translate. We congratulate M. Colard on his success in carrying out a difficult undertaking.

COMPETITION OF PROCESSES FOR LANTERN SLIDES

BY GEORGE SMITH.

An editorial article bearing this title which appeared in a recent number of the Photographic News (p. 674) seems to me to call for some remarks. Owing, doubtless, to some misapprehension, the negatives in question were handed to me for the purpose of reproduction by the Woodbury process, before I was made acquainted with the origin and object of the competitive trial. I was, unfortunately, not present at the meeting of the London and Provincial Association when the project was discussed, and had only heard accidentally that they were going the rounds. What I said at the recent meeting when the subject was again discussed has evidently been misunderstood. I went there for the express purpose of learning what was really wanted. First, how the slides were to be judged, and secondly, on what points. Neither appeared to have been considered. I could only gather that they would be examined, and the one which rendered the nearest the half-tones of the negative would be the one preferred. I still fail most completely to see in what way the proposed trial can possibly help the point in view. Who can doubt that from two admittedly good negatives, results that can leave nothing to be desired could be done by any process? Surely the necessary transparence of the shadows and clearness of the high lights can be guaranteed by an expert in any of the recognised photographic processes. The proposed test would therefore necessarily run the various photographic processes very close together, and become one of very nice discrimination to detect any difference whatever, except possibly in some. When, however, the highest skill of the various photographic processes becomes, as in this case, pitted against the mechanical process which I employ—and the test will evidently be strained to its utmost to distinguish between them—I thought it necessary to point out that it might very well happen that if it came to be a question of microscopic criticism, the inevitable, though slight, loss inherent in the conversion of a photographic picture into a printing mould would inevitably tell against the mechanical process.

The simple fact is, that the proposed trial cannot possibly lead, at any rate directly, to any decision whatever except that from picked negatives exceptionally good slides from a photographer's point of view, may be produced by any process, whereas, if judged by a general vote of the meeting simply from its appearance on the screen, it would, at the test, only indicate that—either by design or accident—the author of that particular slide had best *interpreted* the negative.

The reply to my question as to what would be considered the best slide, "the one which most faithfully rendered the negative," convinced me at once that the point to be considered in producing a transparency for the lantern had totally escaped the notice of the proposers of the trial.

Nothing is more certain than that a good negative always has a greater range of tones than can be printed by any process. I mean, of course, that unless some of the details are sacrificed, the general result is poor and flat in the extreme. In all ordinary silver prints, not only are the lighter half-tones lightened in the fixing, but the deeper shadows bronzed in the printing, thus giving a more brilliant pictorial effect at the expense of truth of gradation and of light and shade. This is far more the case with the modest gelatine negative than with wet collodion, the range of tones in the better plates being simply enormous, and far beyond printing capacity. It becomes, therefore, very necessary to dodge the printing, not with the view of greatest possible

amount of detail out of the negative—any one by any process can do that—but to get a brilliant picture from a flat negative. Now this is precisely the quality of these negatives, in my opinion. Technically they are excellent, but printed right out by any process, the pictures they will give must be flat and poor.

I foresee, then, that as the first idea is to see which process will give the greatest amount of detail of tone—while every artist would endeavour rather to get the best pictorial effect—the decision will be two-fold, and neither satisfactory. The technical party will squabble about detail, while the practical party will be guided only by general effect upon the screen, and neither will have the slightest chance of learning which is the best process.

Long experience has taught me that it is utterly impossible—or, I should rather say, perfectly useless—to attempt to get all that there is in a good negative. It can of course be done, but the pictorial effect is dull and heavy. This, at any rate, is not the defect in the Woodbury process, for I consider that there is no process which will so faithfully render every gradation of half-tones as this or its analogue, the carbon process.

It is only when the question of sharpness is likely to arise that I have the slightest doubt about the Woodbury process in my hands being treated upon any print. If this extreme sharpness is desirable—as, for instance, in the slides of shells and corals which I showed at the Photographic Society's lantern meeting Oct. 20th—it can easily be obtained.

It is precisely because the greater part of my photographic experience is in connection with the Woodbury and carbon processes that I always insist on the importance of a bit of clear glass in a negative. Nine negatives out of ten—I might say ninety-nine out of a hundred—are over-exposed. What is the use of getting detail which cannot possibly be printed? It may be an advantage on albumenized paper, as otherwise the printing might go too fast, and too many prints be lost from over-printing; but it is a positive curse to all mechanical printing processes, and has given rise to no little vexatious trouble in attempting to render the detail. I repeat, once more, that over-exposure is the glaring defect of the average gelatine negative, and abuse of the splendid power which the introduction of the gelatino-bromide process has given the photographer. I should explain that by over-exposure I mean practically imperfect development, for I am quite aware that it is possible to over-expose and restrain the development. I do not, therefore, advocate an under-exposed negative, but one which is fully exposed, but restrained, so that the deepest shadows shall remain practically clear glass. This will always allow of development being prolonged until proper printing density is obtained. Such a negative is fit for any printing process; but the poor, washed-out ghosts, with enormous amount of detail yet with no contrast, although they may pass muster from their purity and clearness as excellent negatives, are, to my mind, but a very sorry result compared with what judicious treatment would have produced from the same plate.

The standard of excellence in photographic prints is very well understood, and is a high one; but the standard of negatives has a much higher importance, and is very much neglected; while the standard of excellence in a lantern transparency would appear to be very imperfectly understood.

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[From *The Artist.*]

THE rooms of the old Water Colour Society have again been given up this year to a show of work in black and white, which is of considerable importance and unusual excellence. It is not our desire to enter into the chemical side of the art, and we will therefore content ourselves with the record of one fact—the absence, except in one case, of work in collodion. Everything now is gelatine, for everything must be, if not instantaneous, at least rapid. A careful inspection of the 600 odd subjects impresses us with some idea of the very rapid strides that photography has continued to make since the comparatively recent time of Daguerre in his scientific relations; but it also convinces us that though there is an evident endeavour to secure "pictures," there is not a corresponding knowledge of the various rules on which the success of a picture depends. In truth, very little purely "portrait-studio" work is exhibited here, and, with the exception of animal subjects, which, it must be acknowledged, are very difficult to secure, pictorial photography seems to receive by far the greater amount of attention. Amongst this, some of the earliest plates to attract attention are J. P. Gibson's very satisfactory set of subjects taken on the Tyne and on the Allen. Vittorio Stella, too, deserves commendation for the "Views in Switzerland," which have deservedly secured a medal. Not so far from this is a platinotype of Lady Brooke, by H. S. Mendelssohn, which, being hard and slatey, does not do credit to this process. The "Instantaneous Sea Studies," by W. P. Marsh, which have obtained a medal, are very fine; but here, also, the autotype enlargement of one of them, hanging on the other side of the room, is not a success. Four figure subjects, by H. P. Robinson (medallist), hard by, are very excellent, being brilliant and clear, "The Mill Door" deserving especial notice. They are undoubtedly the best figure subjects in the collection. The reproduction of Burne Jones's "Six Days of Creation" is a dismal failure; the "Breaking Wave," by C. Grassin, close by is, however, a very fine study of wave motion. B. Wyle's "Cloudland" is a set of four grand subjects, the bottom one being especially fine. The "Portraits," by J. Lafayette, though occupying the place of honour here, do not strike us as being particularly happy, and cannot be compared with the portrait of Miss Mary Anderson, in the Woodbury process, which is a wonderful photograph of a superb model. The negative of this is by W. & D. Downey. Another set of "Cloudland," by Benjamin Wyles, is very nearly as good as could be desired, and in its unpretending excellence compares very favourably with such subjects as the "Church of the Knights of Malta," by A. G. Tagliaferro. In fact, it will be found that in almost every instance the architectural studies are by no means up to the standard of the other work, and it is refreshing to turn to such work as F. M. Sutcliffe's "River Bank," or H. J. Godbold's "Rescued," which latter is a perfect gem of colour. The studies of flowers by Henry Stevens, are not, we think, quite up to his very high standard, but it may be that he has spoilt us in the past by the very superb work which he has from time to time shown. The portrait of Miss Constable, in the series for which H. S. Mendelssohn has obtained a medal, is stiff and constrained in attitude; but beneath it is one of the most successful photographs, that of Mrs. James in the same series, we ever remember to have seen. There are some good gelatino-iodo-bromide plates, by Captain Abney, of views on the Cherwell, which should not escape notice, and a set of portraits by W. N. Malby, notably that of the Chinese gentleman, deserve attention. "Mother's Love," by J. Hubbard, is poor in tone and unhappy in choice of picture. It has been awarded a medal. The "Yachts racing in the Solent," by G. W. West & Son, are very good, and much elaborate care has evidently been bestowed on them. "North Wales," by Captain Abney, should not be overlooked, and the six "Prize Dogs," by T. J. Dixon, are good. The "River Scenery," by W. McLeish, would be very good were it not so broken up; and G. Hadley's "Small Studies" well merit their medal. In this set, look at the old lady reading in the centre. There is a good subject near this, hailing from the School of Military Engineering, called "Near the Waters-meet, Lyn Valley;" and Edward Dunmore's "Views of Hampstead" are clever. The first series of portraits by Lafayette, which are prominent in this part of the room, have received a medal. The pose is in nearly every instance remarkably well chosen, and is evidence of considerable artistic feeling on the part of the photographer—a quality which is far too often absent. The London Stereoscopic Company have some good work on exhibition; but why Mr. Kyrle Bellew should have been photographed in the bank-holiday attire we see him in, is past comprehension. It is very evident that photographers have much to put up with. "A View on the Hebden," by H. Forsyth, is a good subject, somewhat marred by the waterfall. Edwin Smithells has an eye for real humour, the "Unfamiliar Tune" being decidedly amusing. W. Byrne's portraits of children are too well known to need more than passing reference, and, if the attitudes are a trifle strange, the work is in every way excellent, On the screens Symonds & Co. exhibit some of their unequalled "Yachts," a very clever use of shadow in the first of their series being a good point. Two landscape subjects, by A. Stoll Bailey and F. W. Broadhead, respectively, should be good, but can hardly be seen; and Mrs. S. G. Payne secures a medal with "Knuckle Down Tight," an amusing subject of no great pretensions. J. E. Mayall exhibits a very characteristic portrait of Henry Irving, and the set of "Views" by B. Wyles completes a necessarily prescribed list of what deserves especial mention. One hardly expects to see much improvement over the very good collection of last year, but we feel that this year the average of that season is certainly maintained.

MR. MACBETH'S ADDRESS TO THE EDINBURGH PHOTOGRAPHIC SOCIETY.

We have now reached the twenty-third year of our Society, and have good reason to congratulate ourselves on the life it still manifests. It has attained not only a high position in point of numbers, but many of its members have distinguished themselves in the production of beautiful work, as these walls to-night testify, exhibiting general intelligence in every branch of the art.

I had the honour of being called upon by the Photographic Club of Edinburgh during its last session to make a design for the diploma of its members. I represented photography there, not merely as a handmaid to nature, science, and art, but I designated her as the daughter—filia naturæ scientiæ artisque—a much higher and more endearing relationship, ever ready, ever willing, and ever lovingly endeavouring to meet the wants and profoundly respect the claims of each.

Something more than mere service is necessary in promoting the interest of any of its departments. It is love and devotion to any worthy pursuit that is felt to be the mainspring of successful effort. Any society depending upon mere awards for stimulus, apart from disinterested exertion, soon ceases to have the most wholesome influence. Emulation is good when it can be carried out without giving offence, but in the case of many professional men competing, I find it is the opinion of several of our best members that adjudication and the giving of awards is fraught with considerable danger—apt to make shipwreck of the best of feeling—at least, introducing elements of unavoidable jealousy and dissatisfaction. However, there may be an exception. In the case of young beginners, in the study of any profession, some stimulus is not only necessary, but helpful, and a prize becomes an object.

A society like this has many attractions, and none greater than the opportunities which it presents for the cultivation of taste. We cannot enter upon the smallest detail of any department of its study without feeling the need of acquiring proper methods of procedure, and we always find that the photographer who succeeds most, is one who well directs his work, and spares no pains in cleanliness, and great carefulness of manipulation.

It hardly becomes me to say anything regarding the education essentially necessary to a photographer. Nothing seems to me, who am but a novice in chemistry and the mechanical arts, more important and desirable for anyone proposing to follow photography as a profession than by every means in his power to acquire a sufficient practical knowledge of chemistry and its nomenclature, so as to be able at once to read and work out formulæ as they come from our best authorities.

I think also he should be well read in, and familiar with, some of our best books containing workshop receipts, enabling him to make good use of these in mechanical appliances, such as photogravure work or blockmaking to accompany types—arts which are fast encroaching upon the hitherto laborious and very expensive efforts made in the interests and requirements both of science and art.

Most of our young men who are following photography as a profession find they are best educated in the manipulative part of their work when their services are engaged as general assistants. It is a long time before they are entrusted with the arrangement of the sitter, seldom indeed till they are their own masters. During this early period they should not only be watching how their employers treat their subjects, but they should have an intimate acquaintance with all artistic arrangements, as so well explained and inculcated by Mr. Robinson and others, but more especially exemplified in the works of some of our standard painters such as Velasquez, Rembrandt, and Vandyk.

Then I would have the beginner to discard all painted backgrounds with the ordinary photographic accessories upon them. As the work is derived directly from living subjects, so should the background and surroundings, if such be desired or needed, be composed from real objects, and these as much as possible conforming to the associations of general good society. Any subject is greatly lessened in interest when the same painted background crops up under every arrangement. Much ingenuity has yet to be exercised in directing the light and shade of a background, so as to give full effect to the head and figure. It is in the practice of this treatment that the photographer, apart from development, will manifest his artistic knowledge and judgment.

In making such remarks, I cannot express an honest opinion without fear of offending some one. But permit me to say that photographic portraits are never finer than when thrown out in simple relief from a plain background; it may be painted in certain forms of light and shade, and by turning it round to any position it may be easily adapted to any pose. Simple dark or light cotton fabrics make beautiful drapery. Tapestry and real oak panels made plain, without ornament, are very serviceable; there is nothing more convertible, nor more likely to produce variety, than these. When special objects, such as the old hackneyed pillar and balustrade present themselves, you feel that they are allied to a past age in art. I hope the day is not far distant when there will be a demand for photographic portraits taken in one's home, with the individual associations about them. This would be a great advantage over the painter, unless he too availed himself of such; it would be telling on the originality of portraits were this more recommended and acted upon.

As an artist, I have taken a deep interest in those efforts of photography which are now unquestionably making some worthy appearance in the way of artistic arrangement: I refer more particularly to the treatment of subjects of ordinary human life. Hitherto such attempts have been greatly prevented by many unavoidable obstacles, but I am now not without hope that through general intelligence in the requirements of the picturesque much will be apprehended, especially through instantaneous work, of many beautiful compositions as seen in the unconscious and charming incidents of everyday intercourse, which, without the highly sensitive plate, would never be secured. Success in the gathering of such subjects is only to be had by the concealment of the instrument. I am told that Mr. Edwards, of London, carries nothing with him but apparently a small travelling-bag, with only the front of the lens exposed; and the focus always being suitable, he secures some wonderfully picturesque subjects in every way worthy of being completely treated on canvas.

Knowledge is power. Permit me then to advise all young aspirants aiming at the cultivation of an acquaintance with the beautiful in nature and in art, to look at the works of men famous in design, such as Sir Frederick Leighton, Burne Jones, or one of the most recent, Walter Crane, whose wonderful fertility appears in that beautiful work entitled the "The First of May." Works of such men as I have just mentioned may not be considered at all applicable to photography, because it does not pretend to be creative; but then such works make the best examples of arrangement and composition. Familiarity with good designs becomes educational; at least, to admire such makes one very difficult to please, and puts one in the pursuit of higher attainment. No photographer is to be excused who does not very frequently look at such publications as *The Century*, *Harper*, or the very cheap and interesting work, *The Magazine of Art*. A close and careful acquaintance with these will go far to foster a taste for art, and enable one eventually in some measure to imitate them.

Correspondence.

SWIFT'S OXYHYDROGEN MICROSCOPE.

Sir,—An illustration and brief description of Swift's oxyhydrogen microscope appeared in last week's News, but I think no one will be able to learn much of the purpose and capabilities of this apparatus from the too-condensed description given by the maker, and published in the Journal of the Royal Microscopical Society.

Primarily, I believe, this gas microscope was intended for exhibiting on the screen objects mounted on microscopic slides. Many lanterns for this purpose have been brought before the public from time to time, but all have been more or less unsatisfactory to the microscopist. They all failed in that most important point, *definition*; and when the image was much enlarged, or when any but very low powers were used, the picture was out of focus at the margin. For all but purposes of amusement each lantern has been of small utility, and a good lantern, capable of exhibiting microscopic objects with sharpness of detail and brilliancy of illumination, has been long a desideratum.

With these uses of the lantern I have at present nothing to do, but wish merely to point out in what way it is, in

my opinion, of far higher value than an instrument, no matter how perfect, for merely showing objects on a screen, and how it appears to be, in addition, one of the most complete and valuable pieces of apparatus the photo-micrographer can possess.

Shortly after this lantern was exhibited at the Royal Microscopical Society, one of our most eminent photo-micrographers suggested to the makers that they should try to use it for taking photo-micrographs, which was accordingly done, and with great success. A photograph of a fly's tongue, taken with the lantern and a one-inch lens of 40°, is decidedly the sharpest and most brilliant photo-micrograph I have ever seen. It was taken on a quarter-plate, but later experiments have proved this apparatus to be capable of making photographs of almost unlimited size, without any perceptible loss of sharpness. The illumination was given by a microscope lamp of good construction, burning paraffine, simply to test the general applicability of the lantern for photo-micrographic work, for it is not always convenient to use oxyhydrogen gas, although, had it been used, the exposure would have been considerably shortened. Doubtless, for great amplification, or with high powers, it would be advisable, or even necessary, to use gas, to get sufficient light; the same may be said with reference to using the polariscope, which always cuts off a large amount of light.

The smaller photographs were taken with convergent light direct from the condensers; in fact, the lantern was precisely in the same condition as when projecting on the screen in the ordinary way. When large photographs, such as would be suitable for lecture diagrams, are required, an achromatic meniscus lens must be used to elongate the circumferential rays, and thus get a flat picture; but with small pictures this is not necessary, as all requisite flatness of field is obtained without it.

For such a picture as the first one taken, fly's tongue, an exposure of three minutes was found necessary, with paraffin lamp, using Wratten and Wainwright's plates. The fact that this object, which, as every microscopist knows, is a good test of the definition of the lower powers, came out with such brilliance and sharpness, proves that this lantern is eminently suited to the requirements of the photo-micrographer, and I am glad to be able to call the attention of my fellow-workers to such an acquisition.

As a rule, photo-micrography is very troublesome and fatiguing work, and none but those who have devoted much time to it can appreciate what a real blessing it will be to get rid of the camera and all the paraphernalia of lamps, condensers, focussing eye-pieces, rods and screens, &c., &c., and use only a convenient lantern, mounted on a tripod stand. Instead of tiring and trying one's eye-sight by staring down a brilliantly-lighted tube to focus some troublesome object, it will be only necessary to focus the object by means of a milled head on a white card, fastened in a suitable position on the wall, or on a convenient holder, just as if one were making an enlargement from a negative. Instead of stooping in an unhealthy and uncomfortable position over a microscope on a low table, to perform the operations of illuminating and focussing, the worker can stand upright, and by means of the tripod raise the lantern to any height desired. Even though it be only possible to use lenses varying from 5 inches to a ¼-inch focus, this instrument will be of the greatest service, and I look forward to working it with no small degress of pleasure.—I am, sir, yours faithfully I. H. Jennings.

EXHIBITION AWARDS: HOW THEY WERE MADE AND ARE MADE.

Sir,—The expression of discontent by the many at the awards made to the few continues. Some go so far even as to doubt the capacity of the judges, without taking into consideration the method of judging. This method is no secret, as it has been described by yourself in the Notes of October 17th. Each judge examines and gives a number of marks to every picture. There is no communication between the members of the jury. After going through the painful and weary process of looking at and estimating every picture, the marks are collated, and the pictures that get the highest number of marks are medalled. This plan is of recent introduction, and is objectionable in many ways. It looks fair on the face of it, but I believe the judges themselves were astonished that some of the honoured pictures got medalled. It is most wearying to those who have to look at every picture, and especially unfair to those who send the largest number. For instance, a judge may say to himself, "Jones has sent a splendid collection, he ought to have a medal; I think No. 1 is best, and will give him 10," which he does, but he is so convinced No. 1 is best that he gives lower figures to Jones' other exhibits. Another judge is delighted with Jones' contributions, but likes No. 2 best, and gives it 10 marks, and less to the others, and so on with the other judges, each preferring different pictures. When the marks are collected it is found that the votes are so divided over Jones' pictures that he does not get a medal, while another exhibitor sending only one or two pictures has obtained the honour for very inferior productions, because the notes were concentrated. By this method, moreover, it is difficult to award the medals in classes—that is, to divide them between portraits, landscapes, genre, &c., which all the discontented seem to think desirable.

The method has one use, and one use only, as far as I can see. It enables the President to proclaim, when he presents the medals, that every picture had the careful attention of every judge. But this does not compensate for the well-founded discontent that has arisen since the method was introduced. The old plan was infinitely preferable. The judges met to find out the best dozen or so of the pictures, and to award the medal to the best man. Each judge made a list of the pictures that in his opinion professed the greatest merit, and it was not easy for a good picture to escape six pair of practical eyes. They then met together and discussed the matter, and made the awards. It would be absurd to say no mistakes were ever made by this system, but they escaped the wholesale discontent we are now experiencing. An Old Judge.

[We have already remarked that complaints as to the awards appear to us to have been fewer than usual this year, and seem to be almost entirely confined to those who have been disappointed in gaining medals; while, on the other hand, expressions of satisfaction are very numerous, and this may be taken as an indication of the value and fairness of the present equitable method. Surely our correspondent exaggerates the case in writing of "expressions of discontent by the many," and "wholesale" discontent. —Ed. P. N.]

Proceedings of Societies.

Photographic Society of Great Britain.

The first ordinary monthly meeting of this Society for the present session was held on Tuesday, the 11th inst., at the Gallery, 5a, Pall Mall East, Mr. James Glaisher, F.R.S., President, in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members of the Society:—Messrs. W. M. Crouch, F. Machell Smith, E. Smithells, G. E. Thompson, T. Furnell, W. Brooks, Hy. Smith, W. P. Marsh, Ernest E. White, G. H. Martin Whish, T. J. Smith, Jn. Mason Harrison, Chas. Harrison, C. F. W. Sage, W. E. Halse, A. Spiller, J. Harrison Low, M.R.C.S., M. Loring, S. Stagall Higham, T. C. Turner, Junr., B. G. Wilkinson, Junr., T. Scanlan, F. Maude, T. E. Freshwater, J. G. Gibbs, H. G. Moberley, M. H. Clerk, Rev. J. S. Knight, R.N., H. S. Mendelssohn, T. Whitehead, A. Mackie, K. B. Murray, F.R.G.S., F.S.S., G. H. Hunt, D. Barnett, M. Anty, G. Hadley, W. W. Winter, J. Lafayette, S. D. McKellen, H. Bambridge Hilditch, Hon. Slingsby Bethell, B. Wyles, J. Stone, and J. Duncan Pierce.

In reply to the Chairman's enquiry respecting the Exhibition medals, the Hon. Treasurer (Mr. W. S. Bird) stated that

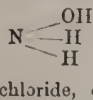
through some hitch the medals had not arrived in time for the meeting; he had a promise that they should be delivered by nine o'clock, and he hoped they would arrive before the meeting closed.

The Chairman said it would gratify the members to hear that the number of attendances at the exhibition was even better than last year. In 1883 the number of members was 718; this year it was 781, being 63 more than that of the previous year. In 1883 the number of tickets reached 4,046; this year the number was 3,732. In 1883 the number who paid was 4,057; this year there had been 4,477. The amount received at the doors last year was £227 9s.; this year they had taken £244 3s. As each year the attendance was larger than that of the previous year, and the money takings likewise increased, so he hoped it would continue; it was also satisfactory for the Society to know that their work was so much appreciated. Speaking of the jurors, he said their work was laborious; every picture was examined separately by each juror, who assigned a certain number to it; these figures were summed up, and from the totals obtained, the highest received the medals. The jurors had accomplished their difficult task in the most faithful manner, and he asked that the usual vote of thanks be accorded to them.

The vote being accorded,

The Chairman requested the members to accord a vote of thanks to the Hanging Committee, which was done. He then called upon Mr. Arnold Spiller to read a paper on "Hydroxylamine used as a Developing Agent."

Mr. A. Spiller, having traced the history of hydroxylamine, said he first brought it under notice about two months ago in an article published in the Photographic News; since then he had made further experiments, and now took the earliest opportunity of bringing it before this Society. Hydroxylamine, he said, was one of the numerous ammonia compounds, having the formula NH_3O. By replacing one atom of hydrogen with hydroxyl the compound is formed, and may be represented thus:



Hydroxylamine, hydrochloride, or hydrochlorate, could be easily produced in an aqueous solution, and it had the property of decomposing silver bromide, when in the presence of a caustic alkali, into metallic silver, bromide of soda, water, and laughing gas, as shown by the following equation:—

$$2NH_3O+4AgBr+4NaOH=Ag_4+5H_2O+4NaBr+N_2O.$$

This was illustrated by mixing the components in a beaker, when metallic silver was shown to be reduced. Mr. Spiller further stated that, unlike pyrogallol, this substance does not absorb oxygen from the atmosphere. Neither does it stain the film. It is now an expensive salt, but if in constant use there is no reason why it should not be cheap. The developer, suited to an ordinary good commercial plate, was given as follows:—

Hydroxylamine hydrochloride ...	2 grains
Caustic soda	5 ,,
Bromide of potassium	½ a grain
Water	1 ounce

The caustic soda takes the place of ammonia, and hydroxylamine supplants pyrogallol; it admits of a wide latitude of exposure, and, not being an oxygen absorbent, enables better colours to be obtained—especially so with gelatino-bromide paper. The only drawback is a reticulation of the film in those plates where soft gelatine has been employed. Examples of negatives and bromide paper so developed were passed round. By modifying the proportions, several colours could be obtained on gelatino-chloride plates, many of which were admirably suited for the lantern. In conclusion, he hoped photographers would give the new developer a trial, and make known their results.

Mr. W. E. Debenham remarked that Mr. Wellington had shown transparencies on bromide plates, developed with hydroxylamine; the colours were very beautiful, but they had a defect, viz., punctures somewhat like that of a needle point all over them. The plates were a slow batch, made expressly for transparencies.

Mr. J. Spiller remembered pyrogallol being sold at 16s. per ounce. There was not the least reason why hydroxylamine should not come down from its present high price, 10s. 6d. per ounce, like pyro has done.

Mr. Leon Warnerke enquired whether it was found to be a more powerful developer than pyro or ferrous oxalate?

Mr. A. Spiller, in reply, said the punctured marking referred to was a reticulation, caused by the use of a soft gelatine; it was due to an evolution of nitrous oxide in the film. It was not so powerful an agent as pyro or oxalate. By increasing the alkali there would be more detail obtained.

A hearty vote of thanks having been accorded to Mr. Spiller,

The Chairman said he was glad to find a new member making such a good beginning, and hoped to hear other papers from Mr. Spiller, and that other new members would follow his example.

Owing to the absence of Capt. Abney from London, his paper on "The Siemen's Unit Lamp applied to Photography," was read by the Hon. Secretary, W. F. Donkin, Esq., M.A., &c. Capt. Abney mentioned several forms of unit lamps hitherto recommended, but few worked as well as "Siemen's." The principal points in this lamp were the fixed diameter of wick, 3-16ths of an inch, and a guage fixed at a suitable distance, the top of which is 2·6 inches from the level of the wick-holder. Acetate of amyl, a substance very cheap in Germany, was found to be best suited to burn in this lamp, and in case of draught, Captain Abney suggested the addition of a glass chimney or cylinder; also an extinguishing screw-cap to prevent evaporation when out of use. He (Captain Abney) had tried it with a sensitometer eighteen inches off, and obtained the same illuminating power as the phosphorescent tablet, and the unit lamp is reliable. Any ordinary spirit lamp can be utilized if the burner is the same dimensions as that previously mentioned; and as acetate of amyl is easy to obtain, anyone can have a standard light much better than the ordinary standard candle.

Mr. J. Spiller remarked that there would be no difficulty in making perfectly pure acetate of amyl, should it be required for this purpose.

Mr. W. Bedford referred to difficulties he met with from reflections when testing standard lights, and said that as so much depended on the surroundings, an absorber was required as well as a reflector.

Mr. T. Sebastian Davis, having experienced similar difficulty, now took the precaution to place a reflector one meter behind the flame of his lamp.

Mr. Debenham suggested that Mr. Bedford should use the simple flame direct from the lamp, lining the lamp with black velvet, and making use of a velvet lined tube, thus cutting off all reflection.

A vote of thanks having been passed to Capt. Abney for his paper,

The Chairman congratulated the following, who were awarded medals by the Society:—Mrs. S. G. Payne, Messrs. Vittori Sella, W. P. Marsh, H. P. Robinson, The Autotype Company, Messrs. C. Grassin, G. Renwick, H. B. Berkeley, Sig. A. Tagliaferro, H. S. Mendelssohn, J. Werge (on behalf of the family of the late Mr. J. Hubbard*), G. West and Sons, Adam Diston, G. Hadley, J. Lafayette, T. and R. Annan, J. Atkinson, M. Auty. Extra medals:—J. Gale (transparencies), S. D. McKellen (improvements in cameras.) The medals not having arrived, the Chairman was unable to present them as usual.

The Chairman said there were many others who had sent pictures of great merit, and to whom he should liked to have presented medals, among whom were Miss Cotesworth, Messrs. Stevens, Dixon, Willis, Pointer, Gillard, Malcolm Clerk, Sutcliffe, Captain Abney, A. and G. Taylor, Seymour Conway, Wyles, School of Military Engineering, Robinson and Thompson, Wainwright, &c., &c., all of which were so good that he only wished medals had been awarded to them as well. Mr. Furnell's shutter was beautiful in its arrangements, and none the worse for the hard usage such things usually get. Mr. Cadett's new shutter was also good, and he could speak highly of all the apparatus shown. Their's was not a professional Society, yet professionals had a majority of the awards this year; hitherto, amateurs had taken the majority of medals. He must say that the amateurs were getting a little behind; he had noticed this elsewhere as well, and hoped that they would strive to keep up with, if not to surpass, their professional brethren.

Before closing the meeting, he wished to congratulate the Society on its large accession of new members; he hoped they would be all workers, and that the Society would do as good scientific work in the future as it has done in the past.

It was announced that the next technical meeting will take place on Tuesday, the 25th inst., and the next ordinary meeting on Tuesday, December the 9th.

Some of the medals having arrived after the meeting closed, the Chairman presented them to those medallists who were present.

* The sudden death of this gentleman was recorded in our issue of last week.

SOUTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE ordinary meeting of this Society was held on Thursday, the 6th inst., at the House of the Society of Arts, John Street, Adelphi, W.C.; Mr. W. ACKLAND in the chair.

The minutes of the previous meeting having been read and confirmed, the Hon. Secretary and Treasurer read a letter from Mrs. Hughes expressing her thanks for the Society's vote of condolence, which was exceedingly gratifying to her, coming as it did from those whom her late husband liked to be amongst.

The CHAIRMAN remarked that as it had been decided to send circulars to the members ascertaining their views on the future of the Society, he would ask the Secretary to announce the result before calling upon Mr. J. Traill Taylor to deliver his lecture on Florida.

Mr. F. A. BRIDGE (Hon. Secretary and Treasurer) had only received twenty-six replies up to date; seven of these were in favour of winding up the Society, nine desired its continuance, and the others were doubtful; they thought the Society's composition must be changed if it were desired to continue. Mr. Bridge said it was in the hands of the members; any alterations of rules or other changes were subjected to notice which must then be given. If they decided to continue the Society he was quite prepared to keep it on. The meeting being favourable to its continuance, Mr. Bridge gave notice of certain modifications he should bring forward at the annual meeting, amongst them reducing the number of vice-presidents to three, and augmenting the committee to twelve. The nominations for office being completed, notice was given to alter the name to "The London Photographic Society," and to rescind that portion of Rule 13 which entitles country members to only subscribe 5s. annually.

In remarking upon the present crisis, Mr. Bridge inquired who started the cry of fire? He had yet to learn if there was any reason why the Society should be dissolved. The loss of their president was a great misfortune, but no valid reason why they should fall. The spreading the report that the Society would die had caused forty-five members to keep back the subscriptions which were due, so that it would be easy to settle the disposal of the funds. Added to this, a resolution had been passed by another society that they would admit the South London members without the usual entrance fee. He (Mr. Bridge) thought it was a pity they had not been allowed to die before receiving offers of burial.

The CHAIRMAN said he had pleasure in introducing a gentleman they all knew who had kindly promised to entertain them.

Mr. J. T. TAYLOR commenced by saying that his lecture would take the form of talk on "Florida," its orange groves and aspects, illustrated by photographic transparencies, thrown on the large screen by means of the lime light. Having traced the history of Florida and its position, the lecturer started from Glasgow, exhibiting many well-known scenes of that locality. Progressing down the Clyde, were shown some fine examples of shipping, moonlight effects, &c. After passing an iceberg New York was reached, several very interesting places being here shown, among them a portion of the great statue of Liberty, presented by France. After visiting Niagara, under severe frost, the lecturer proceeded to Florida; here he illustrated the method of clearing land of timber, and making ready for planting a grove of orange trees, following it up with scenes showing the various stages approaching maturity. Wild duck hunting, fishing, and shooting were illustrated, as also were the settlers' dwellings and tropical productions.

Mr. J. T. HOPGOOD passed round a large photograph of his own orange grove. Having just returned from Florida he would be happy to answer any questions respecting the place.

Mr. W. COBB said he was sure they were all greatly indebted to Mr. Taylor for providing such an interesting and instructive evening; he fully expressed the wishes of all present when he said, may Mr. Taylor be rewarded for his enterprise in the beautiful State of Florida.

The CHAIRMAN having thanked Mr. Taylor for his lucid lecture, moved a hearty vote of thanks, which was accorded.

Mr. TAYLOR, in reply, took the opportunity of bidding his old friends adieu.

The CHAIRMAN announced that the annual meeting would take place on Thursday, December 4th, and the annual dinner at the Holborn Restaurant, on Tuesday, December 16th.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AT the usual weekly meeting on Thursday, the 6th inst., Mr. W. E. DEBENHAM occupied the chair.

Mr. T. WALTENBERG, having had occasion to use a fresh sample of ready-sensitized paper, had found toning very uneven with it. The prints took a very long time to tone, and were covered with markings and red spots. He asked if any of the members could explain the cause.

Mr. STARNES had experienced the same difficulty in toning with ready-sensitized paper, spots frequently appearing on the prints.

Mr. T. BARKER mentioned a like result from some paper he had recently used; he attributed it to the decomposition of the albumen. He afterwards tried some paper that had been in his possession for a considerable time; this toned easily, and with excellent results.

The CHAIRMAN said he believed the markings and spots were due to the condition of the toning bath caused by using ready-sensitized paper. He had given up using it on this account, and returned to his old plan of sensitizing the paper himself. He did not think it was due to the decomposition of the albumen—instancing the case of a paper giving off a most offensive odour, but toning excellently. The Chairman referred to a ready-sensitized paper that was in the market some years since, prepared with carbonate of silver. He asked if any of the members had seen any published formula of this preparation, as he considered it a far better ready-sensitized paper than that now sold.

Mr. HADDON remarked that he had failed to intensify some thin negatives with bichloride of mercury and sulphite of soda.

The CHAIRMAN said if negatives were washed after bleaching in the same vessel together with the plates from the fixing bath, the hyposulphite in the water would prevent subsequent intensification.

Mr. HADDON asked if there was any better way than the tentative method of finding the chemical focus of an object glass which had been corrected for visual rays only.

The CHAIRMAN suggested sloping the plate at a strong angle for obtaining the coarse adjustment—a gentle slope giving the fine adjustment.

The HON. SEC. read a letter of thanks from the members of the Edinburgh Photographic Club in reference to the recent prize competition of pictures.

Mr. J. M. McKellen, of Manchester, was elected a member of the Association.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE twenty-fifth annual meeting of the Society was held in 5, St. Andrew Square, on Wednesday, the 5th November, Mr. W. NEILSON in the chair.

The minutes of last annual general meeting and last ordinary meeting having been read and approved of, the ballot box was opened, and the following gentlemen declared duly elected:—Messrs F. W. Palmer, Edward Binning, Charles Waterson, and Alfred Tagliaferro.

The Council, in their annual report, congratulated the members on the continued prosperity of the Society; alluded in terms of regret to the death of Mr. John Lessels, who for seven years had been the esteemed President of the Society; and chronicled the fact that during the past session the Society had lost four members by death, and thirty-seven members by removal or resignation. Fifty-five new members had been elected, making an increase of fourteen; the total now on the roll being four hundred and six.

Then followed a list of the papers that had been read, of which our readers have from time to time been informed.

Among other matters of interest alluded to in the report were, the annual display of work at the December meeting; the presentation of photographs by the late Mr. Lessels; a portrait of the late Mr. John Lessels by Mr. Bashford; and a non-actinic lantern by Mr. Wardale; the distribution among members of packets of hydrokinone and samples of gloy; a ballot for photographs; the adoption of a revised edition of the laws of the Society; and a record of the three popular meetings held in Queen Street Hall.

The annual trip took place on the 10th July, when by the kindness of R. Dundas, Esq., a most enjoyable day was spent at Arniston.

The presentation print for 1882-3, entitled "Brambling," by Mr. Slingsby, of Lincoln, has been distributed, and that for the past session will be issued shortly.

The report was unanimously approved and adopted.

The Treasurer's report showed a balance in hand of £67 17s. 3d.

The Curator stated that he had prepared no written report

but that a sub-committee had been appointed during the past year, who had catalogued and examined all the property of the Society, and to their report he referred. The Society's property, as there specified, was in good condition.

The Society then proceeded to the election of office-bearers for the ensuing session, and on the recommendation of the Council, the following gentlemen were unanimously elected :—

President—Mr. Norman Macbeth, R.S.A.

Vice-Presidents—Mr. J. G. Tunny and Mr. Wm. Forgan.

Secretary—Mr. W. T. Bashford.

Treasurer—Mr. A. M. Forbes.

Curator—Mr. J. M. Turnbull.

In room of the four members of Council who retire by rotation, Messrs. W. Neilson, James Crighton, Wm. Crooke, and G. G. Mitchell were elected, and to fill the vacancy caused by the election of Mr. Forbes as Treasurer, Mr. Hugh Brebner was unanimously elected.

Mr. Macbeth then took the chair, and after a few preliminary remarks read a paper, of which an abstract is given on page 731.

Mr. NEILSON, in proposing a vote of thanks to Mr. Macbeth for his paper, remarked upon the great strides which photographers had made in the æsthetic department of their profession, and he asked the members to compare some of the pictures (?) which were still to be found in some of their old albums, where the fluted pillar and the vice-like head-rest predominated, with the artistically posed groups and other lovely specimens of the photographic art displayed on the walls. And not only that, but he observed a very marked improvement in the pictures from those of last year, both in artistic treatment and in manipulation. But there was still room for improvement, and he thought what was principally required was the artistic training of children.

Votes of thanks were then passed to the out-going and in-coming office-bearers, which were suitably acknowledged.

The President then called the attention of the meeting to the display of pictures on the walls, which, the curator explained, had been sent in by members for exhibition.

A discussion followed as to the continued publication or otherwise of the Transactions ; a first and imperfect proof of the presentation print for the past session was laid on the table ; members were reminded that subscriptions for the current year were due, and after a vote of thanks to the Chairman, the proceedings terminated.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

THE second monthly meeting for the season was held in Lamb's Hotel, Dundee, Thursday, 6th inst. The President, Mr. J. C. COX, occupied the chair, and there was a good attendance. After the routine business had been disposed of, a discussion took place on the advisability of holding another Photographic Exhibition.

Owing to the great success of the previous one, the idea was warmly taken up, and it was agreed to hold an International Exhibition in the beginning of 1886. The committee will be elected at the next meeting.

Dr. TULLOCH then gave a lecturette on "Photographic Optics," illustrating his remarks by means of blackboard diagrams. The speaker was most attentively listened to, and at the close of his paper he indicated his willingness to answer any question relating to the subject. A number of inquiries were made and readily answered.

The Council have made arrangements for a Lantern Exhibition to be given in December, and the Chairman also intimated that a practical demonstration of the process of development would be given in the Society's dark room on Monday, 1st December. Members were invited to bring exposed plates with them, and an experienced member will be present to develop them.

COVENTRY AND MIDLAND PHOTOGRAPHIC SOCIETY.

THE monthly meeting was held on Thursday, November 6th, the President of the Society in the chair. After the nomination of officers for the ensuing year, &c.,

Mr. H. W. JONES, F.C.S., exhibited a very convenient method for using ordinary gas in his "Lancaster" ruby lantern, with an arrangement by which he could turn on the ruby light or white light at will.

Mr A. SEYMOUR also sent some negatives, which were thought to be very fine, not only for their artistic merit, but from the fact of their being developed by the soda developer.

The PRESIDENT then called upon Mr. T. Baynton for his paper on the "Making and Development of Gelatino-Chloride Plates" (see page 727)

The transpareneies passed round were very fine, and were much admired, especially when shown in the lantern by Mr. Ambrose.

After a hearty vote of thanks to Mr. Baynton, the meeting broke up at a late hour.

DERBY PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting was held at the Loudon Restaurant, Irongate, Derby, on Wednesday evening, Nov. 5th ; Mr. Arthur J. Cox in the chair. The minutes of the previous meeting were read and confirmed.

Mr. J. W. PRICE then read a paper entitled "Reminiscences of the Old Collodion Days," during which he showed some excellent photographs of the "Roches."

Mr. J. MERRY proposed a vote of thanks to Mr. Price for his paper, Mr. Lovejoy seconded, and the vote was carried unanimously.

A vote of thanks to the Chairman brought the proceedings to a close.

The Annual General Meeting will be held on the 3rd inst., when a paper on "The Photographic Processes used in Copying Drawings," will be read by Mr. Thomas Scotton.

THE PHOTOGRAPHIC CLUB.

THE annual general meeting of this Club was held at Anderton's Hotel on the 5th of November last.

The report for the year was submitted by the officers to the meeting, showing a steady increase in the popularity of the Club by the numbers of attendances, which have been largely augmented during the past year, these amounting to 1,296 against 1,027 of the previous year, and 872 of the year before. A laboratory has also been built and fitted with the necessary appliances and chemicals, to which members have free access. The number of members is steadily increasing, and the financial condition of the Club is extremely satisfactory. During winter months the optical lantern has been a source of interest ; many new or valuable modifications of apparatus and processes of development have been shown or demonstrated. One very useful feature is, that if any new invention connected with photography, or new process, is laid before the Club, it has its *practical* value fairly and impartially ascertained. These considerations, together with the thoroughly pleasant and social manner in which the meetings are conducted, offer such special advantages to both amateur and professional photographers, as were quite unattainable previous to the establishment of this Club in 1879.

ST. HELEN'S ASSOCIATION OF SCIENCE, LITERATURE, AND ART.

Photographic Section.

AT a meeting held at the Association Rooms, Mr. HEATHER occupied the chair.

After the ordinary business,

The CHAIRMAN showed half-a-dozen views of the moon taken during the eclipse of the 4th ult. with his camera, the exposures varying from one to five seconds.

Mr. TAYLOR showed about twenty views of Dutch life and scenery.

Mr. SHERLOCK said, in regard to a difficulty some members appear to have in filtering emulsion, that he found it an excellent plan to use the vacuum pump, and suggested the use of asbestos or powdered glass for filtering through.

A few transparencies, made by members, were passed round for inspection.

Discussion then took place on the action by excess of HCl in emulsion, action by $AgNO_3$ in Fe_2Cl_6 toning bath, &c., and the meeting adjourned.

BRADFORD AMATEUR PHOTOGRAPHIC SOCIETY.

THE first meeting of this newly constituted Society was held in the Free Library on Thursday evening last, when there was a full attendance of members. The President, Mr. Duncan G. Law, delivered a short address touching on the rise and development of photography down to the present time. Afterwards Mr. Scorah, the Secretary, gave a Lantern Exhibition.

We understand that the Society commenced work with a full complement of members, and we congratulated the promoters on having made so successful a start.

Talk in the Studio.

SOCIETY OF ARTS.—Under the able and euergetic directorate of Mr. H. Trueman Wood, it is evident that the Society of Arts will thoroughly maintain its leading position; and we will now give a few particulars regarding the full and varied programme for the coming session. Captain Abney will give a short course (two) of Cantor Lectures on "Photography and the Spectroscope," the dates for these being fixed for April 20th and 27th. Another communication of especial interest to photographers will be one on "The Influence of Civilisatiou on Eyesight," by the eminent surgeon, Mr. R. Brudenell Carter, but the date for this is not yet fixed. Among others, the following papers may be mentioned:—George Buchanan, M.D., F.R.S., "The International Health Exhibition"; W. H. Preece, F.R.S., "Electric Lighting in America"; Ralph H. Tweddell, "The Employment of Hydraulic Machinery in Engineering Workshops"; George Clulow, "The History aud Manufacture of Playing Cards"; A. J. Ellis, "The Musical Scales of Various Nations"; B. W. Richardson, M.A., M.D., F.R.S., "The Painless Extinction of Life in the Lower Animals"; Professor E. Ray Lankester, M.A., F.R.S., "Marine Biological Laboratories: Their Organisatiou, Work, and National Importance"; Anton Jurgens, "The Preparation of Butterine"; Sir J. N. Douglass, "Recent Improvements in Coast Signals"; P. L. Simmonds, "Prospective Sources of the Timber Supplies of Great Britain"; Professor H. S. Hele Shaw, "The Evolution of Machines"; Frederick Siemens, "Tempered Glass." Besides Abney's Cantor Lectures on Photography, the following courses will be delivered:—"The Use of Coal Gas," by Harold B. Dixon, M.A.; "Climate, and its Relation to Health," by G. V. Poore, M.D.; "The Distribution of Electricity," by Professor George Forbes; "Artists' Colours," by J. M. Thomson, F.R.S.E., F.C.S., Lecturer on Chemistry at King's College, London; "Carving and Furniture," by J. Hungerford Pollen; and "The Manufacture of Toilet Soaps," by C. R. Alder Wright, D.Sc., F.R.S., F.C.S. A special course of Howard Lectures will be delivered on "The Conversion of Heat into Useful Work," by W. Anderson, M.Inst.C.E.

A PHOTOGRAPHER'S ART EXHIBITION.—The energy of Mr. Winter, of Derby, has been the means of gathering together a very extensive collection of objects of art, many being the work of amateurs in Derbyshire. Paintings on china formed a leading feature in Mr. Winter's exhibitiou, and there was also a good collection of oil and water paintings. Needlework paiutings upon silk, fretwork, inlaid work, and designs for Christmas cards, were also shown by the Derby amateurs. With a remarkably good taste, Mr. Winter did not give his own photographic work much prominence, and altogether he is to be congratulated on the success of his efforts.

THE ELECTRIC LIGHTS AT HELL GATE.—The installatiou of an Electric Lighting apparatus at this dangerous point is now complete, and the light was turned on for the first time on the 20th ult. There are nine arc lamps, each of 6,000 candle power, the lamps being arranged so as to form a circle. The tower consists of four iron columns, over a hundred feet high, and the *Scientific American* says that every outline on the shore can be distinctly seen, also that the fleet of vessels which come down the river each morning will now be able to pass without waiting for daylight as hithertofore. We should be glad if some of our New York friends would expose a few plates by the light of these exceptionally powerful electric lamps, and let us have prints from the negatives.

PHOTOGRAPHING A CYCLONE.—A photograph is said to have been taken of the cyclone which passed through Dakota on August 28th. The cyclone was discovered about four o'clock on a bright afternoon, when, with the exception of a few heavy banks of cloud, the sky was clear and the sun was shining pleasantly. Suddenly a monstrous funnel-shaped arm shot down from one of the clouds, aud a moment later the cyclone was formed and was moviug slowly across the prairie, carrying destruction to everything in its course. The cyclone remained in sight two hours.

PHOTOGRAPHING A PISTOL BALL AND SOUND WAVES.—In the current number of the *Photographische Correspondenz* is reproduced a series of diagrams of the apparatus employed by Professor Mach in his experiments on the production of instantaneous photographs of various physical phenomena. These experiments, which were described in the PHOTOGRAPHIC NEWS some four months ago, require little commeut now.

PHOTOGRAPHIC CLUB.—At the next meeting, the subject of "Collodion Emulsions" will be considered.

To Correspondents.

*** We cannot undertake to return rejected communications.

G. S. MACKIE.—If you make up the emulsion with less water, and dry your plates more rapidly, you will not be troubled any more with such markings.

PHILIP LERNAN.—The action is probably due to the reducing action of printing ink upon the salts of silver, and it is not likely that pressure has anything to do with the matter, except so far as it brings the sensitized paper in close contact with the printing ink.

C. F. BAILEY.—We do not think you will obtain them in England, but have no doubt that you can get them through any of the Paris dealers in photographic apparatus.

S. G.—It is very good of you to send it, and we will make use of it if possible; but we are not quite sure whether we can do so.

C. E. W.—Our publishers will get the photograph registered for you if you will forward them 1s. 6d. in stamps, and a copy of the picture.

J. HARRIS.—1. It is a very approximate estimate, and you must not attach too much importance to it. 2. It is not absolutely the best; it may be depended on as very good. To say any one form is absolutely the best would be misleading, as it depends on the general direction your work takes.

ED. SHARP.—Thank you: next week.

K. I.—The idea can only be protected by making a claim for building up the article in question out of photographs in the manner you describe, but we have some doubts as to whether the claim would be allowed by the examiners. Still there is no harm in trying, as you only lose a trifle over a pound, should the patent be refused. By registering each view separately, you can protect yourself absolutely as regards the pictures.

T. P.—A series of lessons will appear in the NEWS very shortly.

EXON.—It is due to the fact that on damping, the paper stretches more in the direction of the width of the sheet than the direction of the length. If you require the "long-faced" portraits, you must cut all the pieces of paper so that the length of the sheet is in the direction of the width of the sheet; but if, on the other hand, you require the face to be widened, you must cut the paper in the reverse direction. Generally speaking, the public prefer portraits in which the face is lengthened, to those in which it is made to appear broader than it should. An interesting communication on this subject—written by Mr. W. Coles—appeared on page 778 of our last volume.

JOHN MORGAN.—1. If the size is moderate (say, up to 12 by 10), you will probably find it convenient to make the enlarged negative on a gelatino-bromide plate. 2. The quality of the paper is not very material, but it must be sufficiently stout and tough to bear handling when wet. 3. It is very doubtful whether it will answer your purpose to go; and you would act very unwisely in doing so without making full enquiry.

SERIOUS.—We should certainly regard it as an infringement of the copyright, but you must not forget that there is no certainty when these matters are taken into a court.

C. M.—1. Send us details, and a photograph if possible. 2. As it dissolves in a little over its own weight of water, we cannot understand your difficulty. Possibly you may have had the "chlorate" given to you in mistake. 3. One part of white of egg and six of water.

W. M. BROWN.—You have not warmed the plate sufficiently.

LEARNER.—Your work does you much credit, and it is to be hoped that you will continue to devote time to photography. With respect to the portraits, we would suggest the use of a white reflector on the side opposite the light, so as to relieve the deep shades.

STUDIO.—If you have space you should make it four or five feet longer; the other dimensions will do very well.

L. L. M.—Certainly not. How would you like to be treated in the way you ask us to treat another?

WINDOW.—The ruby glass, of which you send a sample, is quite unsuited for the purpose; indeed, it is rather red brown than red.

MEDWAY.—The background is far too dark. As a rule, a light background should be used when vignetting is to be resorted to.

LUX.—Remove all traces of greasy matter by washing it several times in ether.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1368.—*November* 21, 1884.

CONTENTS.

THE DUBLIN EXHIBITION.

THE Photographic Society of Ireland have good reason to congratulate themselves on the collection of pictures and apparatus that has been brought together by their endeavours within the walls of the Royal Hibernian Academy, and owe no little gratitude to the authorities of that Institution for their great kindness in lending their rooms for the purposes of a Photographic Exhibition.

The public portion of the building, which was erected by private munificence in 1830, was built especially for a picture gallery, and is exceptionally well lighted—at least, as far as the two principal rooms are concerned; the lighting of the third is much inferior to the others.

The collection numbers some seven hundred and thirty frames, together with several albums, a large stand of ceramic photographs, and a small table of cameras, lenses, shutters, &c. In point of quality we believe it will compare favourably with that recently on view in Pall Mall, many of the photographs exhibited there having been also sent to Dublin; while out of eighteen artists who obtained medals this year in London, no fewer than fifteen are represented. A very large number of the pictures have been already noticed in our columns in the notices of the Pall Mall Exhibitions of 1882, 1883, and 1884, so that we need not do more than mention a few of their names. Amongst these are Mr. Tagliaferro's interiors of St. John's Church at Malta (Nos. 163, 235, 308, 309, &c.) Mr. H. P. Robinson shows a large series—The Mill Door (No. 57), "He Never told his Love" (No. 43), "Come Across" (428), and many others.

Mr. W. P. Marsh shows his Sea Studies (No. 242), and Messrs. West a frame of yachts (No. 14), including that figured at page 643. Mr. Symond has two splendid frames of yacht studies (196, 212). M. Grassin's "Breaking Waves" (718) unfortunately came too late, and have been in consequence relegated to the third room, as have his "Folkestone Boat" (No. 720) and "Quai Gambetta" (719). Mr. Renwick shows a number of his inimitable frost studies, full of frosty fog, of which we like Nos. 152 and 445 the best; No. 218, an elaborate composition print of a skating scene, though very wonderful as a piece of manipulation, is not nearly so satisfactory. Mr. Berkeley shows some charming little platinotypes, "A Likely Place for a Trout" being perhaps the best. Messrs. Mendelssohn, Hubbard, Lafayette, Gibson, Koch, Clerk, Shadbolt, Anty, Godbold, Berry, Adams and Scanlan, Nesbitt, Brownrigg, Donkin, Whaley, and others are represented by one or more of their Pall Mall frames of this year, while the Autotype Company's enlargement of Mr. Mayland's great triumph "There's Sorrow on the Sea" (No. 210), and Mr. Robinson's "Nor' Easter," Professor Donkin's "Deut du Geant," both original (186), and enlargement (302). Mr. Pointer's "Brighton Cats" belong to 1883. From the 1882 Exhibition we notice Messrs. Chaffin's "Sisterly Intercession" (125), and "Cherry Ripe" (394); Mr. McLeish's beautiful "Misty Morning on the Wear" (69), as well as some of his more recent work. It would be obviously utterly impossible to notice in a single article, even by name, all the pictures deserving recognition, so we must ask those who are omitted to kindly take the will for the deed.

Before passing on to note a few of the especially Irish photographs, there are two we cannot pass by. One (No. 450), "Reading to Granny," by Mr. Gillard, a charming picture in platinotype, the attitudes of child and grandmother being most natural, and the lighting and general treatment all that could be desired. The other (355), "The Corn Doctor," by Mr. F. S. Seed, is also an admirable composition, the expression of both operator and patient being inimitable, while the technique is unexceptionable.

Taking a rapid survey of the rooms as the numbers go, and passing over those already mentioned and many others, in favour of native work, we may allude to a nice little frame of cloud studies, by Dr. Pearsall (24), and Mr. E. P. Johnson's capital picture of "The *Connaught* steaming out of Kingston Harbour" (59), and H.M.S. *Neptune* (53). Mr. George Mansfield shows a dozen charming studies in the Pyrennees and Spain, of which we fancy most those of "Sauveterre" (71 and 507), the former being unquestionably one of the very best landscapes in the room—no slight praise when McLeish, Renwick, England, Horsey, Brightman, and others are well represented. Messrs. Mavius and Vivash, of Belfast, show a fine frame of large portraits (No. 65), as do Messrs. Crawford, of Dublin, the latter on porcelain (No. 83). Mr. C. W. Watson shows three frames of nice little views (Nos. 79, 290, 529), which are, however, cold in colour, and their tone is further reduced and the effect marred by the folded maroon cashmere on which they are mounted. The last named, consisting of pictures of the Dublin Exhibition Palace, taken down a few years since, are deeply sunk in a frame of almost crimson plush. Mr. S. Baker has two large frames, each containing a large number of views (No. 121), chiefly in North Wales and (303) in various parts of Ireland, and illustrations of Druidical and other antiquities. They are all good and careful works, but in some cases betray the use of a lens of too short focus. At every corner we encounter Mr. J. L. Robinson, who is a most prolific exhibitor, and as he mounts in single frames, his exhibits occupy a large portion of the catalogue.

Mr. John Chancellor, a well-known Dublin portraitist, shows to great advantage; his pictures, though not so pretentious as those which gained a medal at Pall Mall for Mr. Lafayette (Nos. 200, 203, 209), are to our mind far more

refined in style and treatment. We would especially notice (94) "The Belle of the Evening," (116) "The Captain of the Team, (213) "Il Penseroso," and (403) a Portrait.

Mr. Greenwood Pim is represented by five frames; No. 173, Miscellaneous Studies in the neighbourhood of Dublin; of which, a scene in the College Botanic Gardens and a group of sheep are best. No. 211 contains views at Aix les Bains, Venice, and 314 studies of tree trunks in platinotype; 482, views in the English lake district, and 496, "Caught Napping," a gelatino-bromide enlargement from a carte negative of a young lady asleep in a sunny garden. The worthy Hon. Sec. of the Society (Mr. A. Conan) has several frames of Welsh and Irish scenery, snow scenes, &c. (215, 216, 241, 243). Besides Mr. E. P. Johnson, already noticed, instantaneous sea photography is represented (exclusive of Messrs. West and Symonds) by Mr. T. H. Smyth (208) and Mr. F. W. Monsell (175). They are of small size, and, though intrinsically good, are completely eclipsed by the larger pictures. Mr. Rigby sends several frames of pictures of Brazil, Buxton. Other Irish amateurs whose works we have not space to enter into in detail, are Messrs. Baston, Kellsall, Scott, Fleming, Roper, and Codd, whose snow scenes (50 and 51) are remarkably good; Mitchell, Walker, Whittaker, Yeates, &c.

In conclusion, we would draw especial attention to a magnificent series of views in Ceylon, contributed by Mr. W. L. H. Skeen; both originals and enlargements (Nos. 297, 312, and 333) being particularly noteworthy. Mr. H. N. White sends a large stand of ceramics. The chief exhibitors of apparatus are Messrs. Watson, Shew, Sands and Hunter, Mayne, and H. Robinson; the new patent camera of the latter being in especial favour in Ireland.

The medals will be awarded by the vote of the Society. We hope to publish the list next week, together with some further notes on pictures of necessity passed over in the present issue.

Our block print shows some of the pictures at the Dublin Exhibition with the tag labels attached; these labels being removed when all the pictures were hung. Commencing

THE DUBLIN EXHIBITION: MAKING THE CATALOGUE. Negative by Greenwood Pim; Phototype Block by the Meisenbach Co.

on the left hand, the frame standing by itself at the top contains a canvas enlargement by Messrs. Morgan and Kidd; immediately under this is Mr. Dixon's tiger; on each side of the tiger we have studies by Mr. G. Nesbitt. Mr. Mayland's "Sorrow on the sea" will be recognized as next in the same row, and immediately under Mayland's picture is a frame containing three portrait studies by Lafayette; while one remove to the right of this is to be found Mr. Simmonds' admirable collection of yacht pictures. Several other exhibits will be recognized by the reader. Our photograph is by Mr. Greenwood Pim, and he will himself be recognized as being shown seated in the lower right-hand corner. The gentleman seated at the desk is Mr. Mac Carthy, the curator of the Exhibition.

MR. W. COBB'S LONDON VIEWS.

THE photographer in London has much to contend with, and the atmosphere is seldom clear enough for long-distance work, unless very early in the morning; and more especially on a Monday morning, while the bustle and racket of street movement is by no means calculated to steady the photographer's nerves, and may lead to the overturning of the camera or other mishaps. Hence it is that, although one may now and again see a good view of street life in London, a series of such pictures is rare. Mr. Cobb has, however, acquired a reputation for this difficult class of work, and when he cannot use the tripod, he is content to fix his camera to the knife-board of an omnibus, or to the railings of a church, while some of his pictures have, we are told, been taken from the top of a pillar letter-box. On more than one occasion this indefatigable photographer has been mistaken for a dynamiter, and has had to explain his movements to the police; and in a paper communicated by him to the PHOTOGRAPHIC NEWS some twelve months ago, he relates how he was arrested—or perhaps, rather, detained—while photographing the Royal Exchange.

The picture which we present in the form of a supple-

ment this week is one of the best of Mr. Cobb's London views, the busy activity of the street being represented in a way rarely seen. The costermonger with his barrow, a boy wearing his empty basket helmet-fashion, and cab No. 2884, are caught while in quick motion in the immediate foreground. How advantageously such instantaneous views as that we now publish compare with the old style of London views taken with an exposure of some two or three minutes on a Sunday! In one case we have a live and active city represented; while in the other a mere skeleton from which the life and flesh have departed.

When, indeed, may we hope to practically realize the perfection of photographic representation—a series of instantaneous views combiued into active life by means of a zoetrope lantern? But hope and possibility may go even farther than this, for the moving representation may perhaps be made stereoscopic; but to reproduce the objects with all their natural colours appears to be much further removed from the possible.

THE COMPETITION OF LANTERN SLIDE PROCESSES.

On Thursday, the 13th November, the lantern slides which had been prepared by various members of the London and Provincial Photographic Society for the purpose of comparing different processes, were exhibited, and judgment was given on the merits of them.

There was a large meeting, and judgment was accorded by the voice of the whole of the members, the Chairman interpreting the general feeling of the meeting when there appeared to be any doubt. It was a notable feature of the proceedings that there was in almost every case the very nearest approach to unanimity of decision. First, a weeding-out process was gone through, those slides which were manifestly inferior being put on one side. The "accepted" slides were then again passed through the double lantern; in each case the one which had been adjudged best so far being kept in one of the lanterns, so that each slide as it came up might be compared with it, till one came which was adjudged *better*, after which this latter was kept on the standard with which others were to be compared.

"What was the general result of the trial?" will be the natural question. It was not very far different from what Mr. George Smith predicted in a recent number of the Photographic News that it would be. It was made evident that, in the hands of competent manipulators, excellent and almost equally good results could be got by any of several processes.

It should be explained that all slides were from the same negatives, of which there were two, both provided by Mr. W. Cobb. One was a very pretty picture of two children. The white pinafore of one of these, we may say, was a severe test of any process, the difficulty of getting detail in it, without over-exposing to destruction the rest of the picture, being very great. The other was an instantaneous view on the Thames.

By each process two slides of each subject were prepared. The slides from the last-mentioned subject were judged first, and at the end three of them were selected as being the best, and as being one as good as another. It will be understood that till the final judgment was given, no one knew by what processes the slides had been prepared, even the preparers themselves being in most cases unable to recognize their own productions.

When the names of the processes on the three slides adjudged best were read out, it was discovered that two were by the collodio-albumen process, one by the wet plate process. Here, certainly, it appeared that our old friend collodion triumphed; but the next judgment showed that other processes might at least equal it.

When the whole of the slides representing the two children had been gone through, one was adjudged to be pre-eminently good. Two others were considered to fall a little short of it, and to be one as good as the other.

It was announced that the slide declared to be the best of all was a Woodburytype, prepared by Mr. George Smith. The other two were—one a collodio-bromide, the other a platino-bromide plate, specially prepared by Mr. Wellington for transparencies. The beautiful colour of this latter slide was most notable. It was of the warmest possible red, almost approaching crimson. So much for platino-bromide, which most have believed was only capable of giving cold black tones.

The Woodburytype slide deserves somewhat more notice here than we have given it. It was chiefly characterized by the perfect rendering of the gradation of tone. There was not the smallest hardness, nor yet flatness; at the same time, there was no falling off of detail, either in the shadow or in the high lights. The slide was of a warm-brown colour. Mr. Smith created not a little surprise when he stated that the pigment used was pure carbon.

In reply to questions, Mr. Smith stated that he had for long been trying to get a lamp *black* which would be *brown!* the lamp blacks which were sold commercially being totally unfit for Woodburytype purposes. At length he had succeeded. He collected the soot deposited by the tip of the flame of a small benzoline lamp. A tedious process this, one would naturally suppose, and one giving but small returns; but it appears that the quantity of carbon thus obtained, necessary to make a suitable pigment, is infinitesimally small. Mr. Smith says he can make enough in a day to last him for months.

It is only fair to Mr. Smith to say that the slide which produced so much admiration was the only one that he prepared for the competition, otherwise Woodburytype might have come to the fore in the case of the instantaneous subject as well as in the portrait one.

One slide was exhibited which had been taken on a gelatino-bromide plate, and had been developed by the hydroxylamine developer, of which we have heard a good deal lately. It was, next to those adjudged to be the *very* best, considered amongst the best of those exhibited.

As was natural where the judges were all practical photographers, judgment was given more with reference to technical perfections than to general effect, correct rendering of gradations of tone being the thing most of all attended to. There is all probability that a jury of the non-photographic public would have given their decision in favour of the warmer coloured slides, such as those by the gelatino-chloride process. The colodion slides were of course black-and-white, or nearly so, and showed a tendency in the case of the instantaneous subject to give a moonlight rendering.

PHOTOGRAPHY AT THE NATIONAL GALLERY.

In reference to this matter, which we allude to elsewhere, the *Manchester Courier* says:—

"The pictures in the National Gallery are the property of the English nation, but the present Administration has refused permission to an English company, called 'The Fine Art Society,' to photograph certain pictures in the Gallery, and has, at the same time, freely accorded this permission to a German firm of the style or title of 'Braun and Co.' The 'Fine Art Society' did certainly receive permission to photograph pictures as they hung, but this was equivalent to a direct refusal; and although they offered the strongest guarantees for the safety of everything they handled, there was one insuperable objection to them—and one which they were unable to do away with—they were Englishmen. Messrs. Braun, on the other hand, had had full liberty to take down the pictures, take them from their frames, and beyond this, to erect an unsightly and disfiguring iron cabin outside the Gallery, in which to do with these pictures what seemed to them good. On the unfairness of this proceeding being put before the custodians of our great national repository, a reply

was received from the Director to the effect that these German people had been 'engaged for some time past in photographing pictures in the great public galleries on the Continent, where, also, owing to the high importance of the undertaking, unusual facilities had been afforded them.' How any man or body of men can thus proclaim his or their self-stultification passes our understanding. 'Messrs. Braun and Co.' says the Director, 'have received unusual facilities in their own country, and therefore you, as Englishmen, shall receive none in yours.' The 'high importance' of the affair seems to resolve itself into this, that if there be any profit, any praise, any encouragement of industry, to be derived from the reproduction of the artistic treasures of the country, they shall not, while the present people are in authority, be derived by the men of the country."

A block photograph of the galvanized iron building, which the writer of the *Manchester Courier* justly calls "an unsightly and disfiguring iron cabin," recently appeared in the PHOTOGRAPHIC NEWS (present volume, p. 562).

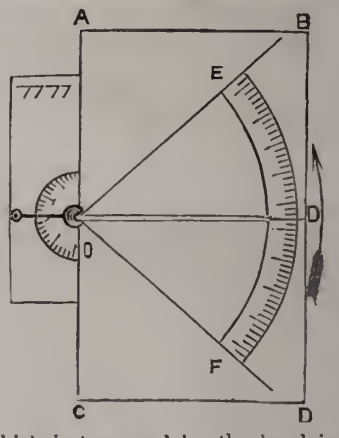
FRENCH CORRESPONDENCE.

PROGRESS IN PHOTO-TYPOGRAPHY—BOCA'S CHRONOMETRIC SHUTTER — PHOTOGRAPHS OF CHANTILLY — MAKING GELATINE FLOW ON GLASS—BALANCE WASHING TRAY.

Phototype Improvements.—Every day brings with it some new experiment to the perfection of photography as applied to the direct formation of typographic blocks. In Paris, M. Krakow, in the house of Lefman, has invented a process similar to that practised by Meisenbach, Angerer and Göscht, and others, and to him is entrusted the work of preparing the plates for the *Figaro Illustré* which has come out recently. I have seen a picture of Meissonnier's, one of Détaille's drawings, and other subjects reproduced in this way. The following is a brief description of the process. A copperplate of the required size, coated with a film of bichromated gelatine, is exposed behind a negative on which a thin pellicle covered with very fine lines is placed. After a sufficiently long exposure it is etched with perchloride of iron. When bitten deeply enough, the plate again receives a film of bichromated gelatine, and is exposed for a second time under the negative, care being taken that the lines coincide, and the pellicle, striped with lines, is placed in the reverse position, so that the effect of lines crossing in lozenge shape is produced. In the same way an engraved plate is obtained by the Talbot process, but that now described possesses the qualities necessary to the formation of a typographic block. The results shown by M. Krakow are very satisfactory. It is almost unnecessary to say that for coloured impressions the use of different negatives executed in this manner gives polychromatic prints having a charming effect. In Switzerland, the firm of Brunner and Kunkler have had the happy notion of making gelatine plates accompanied by a pellicle giving grained or finely striped surfaces, so that after developing, the negative presents the necessary character for being directly transformed into typographic blocks, only by M. Krakow's plan one can obtain successive impressions on the copper plate.

At Marseilles, in Cayer's printing office, another excellent idea is utilised, but in this case it is not photographic, but a method of transferring directly on to stone or zinc designs executed on a particular sort of paper, with a view to typography. It is as well to know something about all processes, because they hang closely together, and one may on some occasions find it easier to have recourse to one method, and at other times to a different one, whether photography be largely used, or only to obtain an accurate outline. Everyone knows that to execute a drawing to be reproduced in this way, the paper is required to have either a granular or striped surface. The drawing finished, recourse must be had to some photographic process to reproduce it on the stone. At M. Cayer's, a striped paper is manufactured similar to that of Angerer's, but with the improvement that the lines or stripes can themselves be transferred on to the stone. As soon as the designer has executed a drawing by scratching out the lights and putting in the shadows with either lithographic ink or chalk, it may, by simple pressure, be traced on the stone. I am assured that this prepared paper will preserve its properties for a considerable time. Photography may come in here for giving collotype images with both outline and modelling of light and shade on this typographic paper.

Boca's Chronometric Shutter.—Ever since the so-called instantaneous photography has been in vogue, amateurs, especially, have guessed their exposures, and no really simple method of measuring the time has been indicated. Several months ago I recommended the reproduction of the hand of a clock rotating on a dial, so as to make the complete circle in the space of one second. The motor was a person who, after a short practice, could effect the movement regularly in the required time; but still this mode of proceeding was more or less indecisive, and the demand for something chronometric resulted in my thinking of using M. Boca's chronometric shuttter. This instrument consists of a dial divided into three equal parts, and clock hand making complete rotation in three seconds. It is set in motion by a clock-work spring, and its speed regulated by a lever escapement. The diameter of this dial being too small for the gradations marked upon it to be legible, I have fixed in front of it a rectangular slide, ABCD, bearing an enlarged arc of a circle, EF, concentric



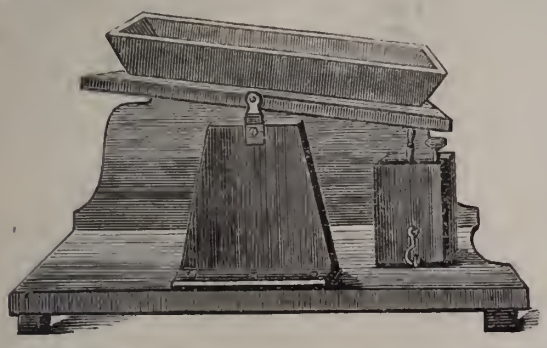
with that which is traversed by the hand in a second; this arc is divided into 200 equal parts, the hand is replaced by a longer one, OI (fifteen centimetres), so as to reach the gradations, and is painted white, while the surface of the slide is entirely black, with the exception of the gradations themselves, marked in white. To make a trial of it, let go the spring, the needle hand will move, and as soon as it has reached F, or shortly after, make the shutter act. On developing, the number of divisions traversed by the needle will be indicated by a blacker tracing on the negative than any of the surrrounding parts. If, for instance, the lighter part cover two or three divisions, it shows clearly that this length of exposure has been two or three two-hundredths, or else one-hundredth, or one-hundredth and a half of a second. A drop shutter having an aperture seventy-five centimetres long, the diameter of the lens being twenty-five centimetres, gave an exposure of nine two-hundredths. I have made two hundred divisions, because one two-hundredth of a second is sufficient for practical accuracy; but there is no reason why further sub-divisions should not be made if desired. Of course plates are required of such sensitiveness to be impressionable with these short exposures, and they do not yet exist; but should the day come, we still have a method of augmenting the speed of the needle as long as its action is regular.

Photographs of the Chateau of Chantilly.—The Due

D'Aumale, after having had the princely abode of the Condé's so intelligently restored, has entrusted nearly all the work of photographing it to M. Chalot. Very large gelatino-bromide plates were used with the greatest possible success.

Method of Making Gelatine Flow on Glass.—M. De Villechole, the maker of the plates used by M. Chalot, says that a cold infusion in water of the plant known as pellitory (filtered after soaking for from one to two hours) is very efficacious for brushing over plates before pouring on the gelatine emulsion, especially when they are large.

M. Leon Baluze's Balance Washing-Tray.—M. L. Baluze has invented a balance washing-tray, of which the diagram



shows the construction. It is set in motion by clock-work, and works from one to two hours. The rate may be increased or lessened at will. On the moving surface any dish up to 28 by 35 centimetres may be placed. I have seen the machine in action, and it does not work too violently to upset liquids, and makes no noise. It will be very useful in developing as well as in etching. LEON VIDAL.

IODO-CHLORIDE EMULSION.

BY V. SCHUMANN.

In some further remarks the writer describes the action of developers on iodo-chloride emulsion prepared according to formulæ given in a former communication (p. 715). Both Stolze's pyro-potash and Eder's oxalate were tried, but the latter gave better results, especially with the films poor in silver iodide.

Herr Schumann has only experimented with the spectrum on the plates, the latter producing, however, surprising results, quite different from the spectrum as represented on pure chloride or iodide films.

All these emulsions produce a higher colour sensitiveness; thus, films prepared by formula No. 1 were equally acted upon from the violet to the indigo, except in the lavender. Those films, which contained a comparatively low proportion of iodide, were extremely thin, and very liable to fog; the others gave a distinct spectrum of great intensity, and with care a negative free from fog.

The same films were also tested with Warnerke's sensitometric tablet, using for the standard light one inch of magnesium ribbon, burnt at a distance of thirty inches. Plate No. 2 showed 20 on the table, and plate No. 1 produced only 18 on the same scale. Thus, it is found, that through the addition of iodide, the general sensitiveness is reduced, although the sensitiveness for the rays of lower refrangibility is distinctly increased. A comparative trial by the sensitomer was also made with a film containing pure bromide prepared according to Eder's ammonia method, digested for three-quarters of an hour at 38° C. The sensitiveness appeared identical with the iodo-chloride film poor in iodide.

From the above results it will be seen that although films prepared according to *formula No.* 1 are hardly suitable for practical purposes, from their liability to fog, yet the plates from No. 2 yield negatives equal to those of gelatino-bromide. The writer has not yet obtained negatives in the camera on iodo-chloride films, but from his spectroscopic results one can easily draw fairly accurate conclusions. Thus, No. 2 formula would yield soft negatives with fine half-tones, while No. 3 should produce images of much brilliancy with very great contrast. Herr Schumann proposes to experiment with the action of ammonia, on the finished emulsion, for by treating an iodo-chloride film with dilute ammonia and drying by heat, it was found that the image fogged directly the developer was applied.

HINTS ON POSING AND THE MANAGEMENT OF THE SITTER.

BY H. P. ROBINSON.

CHAPTER VI.—GROUPS.

THE arrangement of a portrait group of figures is one of the most difficult things to succeed in accomplishing perfectly in photography; more difficult, certainly, than the composition of a picture that would take a much higher rank in art, but of which the materials were more under the command of the artist as regards selection and disposition. The portrait group is often nothing better than a pile of humanity fitted together like a dissected puzzle; a heterogeneous conglomeration of human atoms, and sometimes dogs, not one of which has any artistic relation to another; agreeing in nothing except that each individual of it shall keep rigid and stare at the lens. The painters also have felt the difficulty of making such an arrangement of a group that the result should be a picture without any sacrifice of the portraits. These things are managed better now than they were before the introduction of photography. Everyone is familiar with the ordinary family picture of orange-holding, or mythological women and children immortalized by Goldsmith; or as Byron describes a family group—

> "A lady with her daughters or her nieces,
> Shine like a guinea and seven-shilling pieces."

The photographer is nearly always heavily handicapped by having to give an equally good portrait of each individual in the group, while one of the great principles of art is that one component of a picture shall be more prominent and conspicuous than another. In a pictorial group a back is often useful as a contrast to the other figures; but this is not permissible in such groups as are usually demanded from the photographer. Every face must present a favourable portrait independent of the others; no figure must be sacrificed for the sake of pictorial effect, and therefore there can be little contrast or subordination, so necessary in artistic arrangement. This difficulty is felt by painters who can devote time and attention to each figure, and who also have the great advantage of being able to place their figures on different planes. This absolute necessity for placing all the figures in one plane, so that they may all be in focus, is not so stringent as it was before the introduction of gelatine plates. We can now employ lenses that cover a greater depth of focus than the old portrait lenses, and this enables us to get greater separation in the figures.

The group is the one thing that the photographer dreads especially if there is to be a baby or young child in it, for as the weakest link is the strength of the chain, so every thing depends upon the quietude of a part that can only be depended on to move. However well the photographer may have arranged the other figures, and however strong may have been his injunctions to them as to how they should stand, and in which direction they should turn their faces during the exposure, they have to be vigilantly looked after, and this is almost impossible while you have to devote

all your attention to keeping quiet a restless child. Moreover, the baby is always expected to be made a conspicuous point in the picture, and it is so comparatively small an object that it forms nothing more than a minute speck in the group. It is my experience that few people have any idea how small a baby is until they see it in the centre of a group of grown-up persons.

Groups are taken both in the studio and out of doors. We will begin with the former.

Rejlander used to say that it tasks the skill and attention of the photographer quite enough to see that the arrangement, lighting, and expression of one figure is perfect, and he never ventured upon more, if he could help it, except in combination pictures. But portrait photographers cannot always select their subjects, and must make the best of the material brought to them. Now the most frequent group upon which the photographer is called to operate is that which is composed of two persons, often children—I hope to give the latter a chapter to themselves—but oftener of grown-up people, and perhaps most frequently in holiday towns, young people on their honeymoon, who always seem to be animated with the very praiseworthy desire to have their portraits taken in their new relation. This is one of the easiest groups to take if managed well, but one of the most difficult if it is trifled with. As a rule, the best composition can be got if the lady is in a standing position, and the gentleman sitting. It need not be in a chair or in any very formal attitude, but on a table, or the end of a balustrade. This latter accessory, like all imitations, may be very good or very bad; it should not look clean-cut and new, and care should be taken not to make it prominent. If the picture under consideration is to be a three-quarter length—the most convenient form, perhaps—very little of the balustrade will show. Suppose, then, that the gentleman sitting, and the lady standing beside it, they need not be looking at each other; it is not often that a young couple can do this under the circumstances without laughing, but a common source of interest should be found or imagined. It is easy to suppose they were talking to a friend who does not appear in the picture, or that their attention is called to some interesting object. Resort should be had to device, to give the effect of life and movement to the group, and animation to the heads, and to take away that uneasy and penitential look of being sorry for it, so often seen in pictures of the kind. Here are a couple of sketches of variations on this theme, which may serve as hints for arrangement.

Where the balcony is used, or any other outdoor accessory, it is well to use also an outdoor background.

Very agreeable pictures may be made with two young ladies for the subject. In this case there are plenty of motives for the picture. The occupations of ladies seem to lend themselves to pictorial effect.

It is perhaps easier to make a well composed group of three figures than of two. With two it is sometimes difficult to get variety of line or a picturesque general form to the group, but with three figures the opportunities for variety, contrast, and a pyramidal form to the group, are much greater. So that the unity of the group is preserved, the greatest amount of variety of form should be sought for. Variety in position of the heads can easily be got. It is possible with almost any three figures to arrange the heads, so that they do not come exactly in a line with each other. For instance, it would be possible to arrange the heads formally, thus—

O
O O

but it is quite as easy and much more pleasant to break the uniformity, and arrange them thus—

O
O
O

The same principle is carried out in the group of three children—

If more than three figures are required in a group, it is better to turn the camera on its side, and make a horizontal picture of it. Indeed, in many cases when only three are included, the horizontal form is very useful, as in the following examples.

By placing three children at a table, the difficulties of feet and legs are got rid of, and the heads can be got larger without making the children look older than they are, the table and book suggesting scale. When the heads are all nearly of the same height, variety may be got by placing one of them at a distance from the other two.

In a group of adults, it is well to get some centre of interest, such as reading a letter, as in the last illustration

to this chapter; but care must always be taken not to sacrifice likeness to composition. One of the chief difficulties is to get the heads close together without appearing forced and unnatural.

EMULSIONS IN COLLODION.

BY J. NESBIT.*

The collodio-bromide emulsion process and its various modifications, for several years engaged the attention of experimentalists, but without arriving at the degree of rapidity attainable by its formidable rival gelatine. This has been pressed into every phase of photographic practice with a kind of feverish assiduity, whilst the good features of the older forms are almost ignored. There seems, however, to be some reaction setting in, as was evinced by your favourable reception of the albumen process given recently by Mr. Ackland. In re-introducing the process, for which we are indebted to the genius of one of the members of this Club, Mr. W. B. Bolton, I shall make no apology, and in no way as a competitor with any other system; let each stand on its own merits. I would willingly have ceded the position of exponent to other hands, so now I ask your indulgence whilst I prepare the emulsion in what may be termed its incipient form.

The formula stands thus—

	oz.	dr.	gr.
Plain Collodion.—			
Meth. alcohol	2	6	0
„ ether	2	2	0
Pyroxyline H. T.	0	0	60
Bromizing Solution—			
Meth. alcohol	1	0	0
Water, about			100 min.
Brom. ammon. (58 & 5 grs. exc.) ...			63 gr.
Sensitizing Solution—			
Nitrate of silver			100 gr.
Dist. water			60 min.

The mixture is made.

It will be observed that there is in the above a large proportion of water, but as our purpose is to obtain a finished and washed product, this is of no consequence. If it were to be used in its present form it would be quite necessary to use a bromide wholly soluble in alcohol, such as zinc or cadmium, as even the water imported into it with the silver has the effect of inducing reticulation in the film. Still, many good plates have been done by the simple emulsion process. They were coated with a mixture similar to this, washed singly, and flowed over with an organifier, such as tannin, &c. Now, that the washing of the whole bulk of emulsion, as afterwards proposed by the discoverer, was perfect in principle, is exemplified by the procedure with gelatine at the present day. As I cannot in the time at our disposal to-night go through the whole of the operations, I have brought examples of the different stages up to the final result. We have here our emulsion, which should be allowed to stand for a day, with an occasional shake. It should be then poured into a dish to set into the condition as found in this washing vessel. After soaking, the first water is tested, to find if the bromide be really in excess, and then the washing continued till all trace of soluble nitrate of ammonia and excess bromide has disappeared. The pellicle is now placed in a strong piece of calico, the water and remains of the solvents are squeezed out, and gathered up for drying. This may be done either in a water-bath or spontaneously. As it is now sensitive to light, care must be taken to let no white light reach it.

I show you a dried specimen, which is soluble in equal proportions of ether and alcohol—together about 8 ounces, which will keep good for several years.

This is a small quantity of filtered emulsion made by the above formula; the plates are prepared by simply pouring over in the usual way with collodion, and are ready for use without further treatment. I put in a plate to show the contrast between it and an ordinary gelatine film; also a negative and a transparency.

The reason I have given a formula divested of all the complications introduced subsequent to the first publication is, that I never found any appreciable advantages resulting from their adoption, whilst many difficulties arose, such as spots, fog, thinness of image, tenderness of film, &c. There are other salts capable of emulsification in collodion, chiefly iodide and chloride and their combinations. For the first no satisfactory developer has been discovered. I hope some day to find the iodide yielding up an image to appropriate treatment.

Mr. C. Ray Woods has kindly undertaken to deal with the chlorides.

* Read before the Photographic Club.

A NEW DEVELOPER—FORMIC ACID IN THE DEVELOPER.

BY W. GOODWIN.*

There has lately been much correspondence in the photographic journals on the merits of various substances as preservatives of pyro: sodic sulphite has been well discussed, some swearing by it, others swearing at it. The truth seems to be that pure sulphite is a capital thing when you can get it, but difficult to procure, and to keep when you do procure it. For my own part, I prefer formic acid. Here is a red coloured concentrated solution of pyro and alcohol, with the addition of formic acid; it has been kept ten weeks, yet when diluted with water for use, gives a colourless solution. On the addition of ammonia and bromide, as for developing, you see it becomes very deep ruby colour, then in a few seconds clears to the colour of very pale sherry. It will remain like this for an hour; here is some mixed two hours and a-half ago, which is not yet dark enough to stain a plate.

In using this developer the image comes up with the same rapidity and vigour as with plain pyro. Formic acid is not in any sense a restrainer, but has itself been proposed as a developer; it however neutralizes a small part of the ammonia, so that rather more may be used than with plain pyro. The following is a convenient stock solution:—

Pyro	240 grains
Formic acid	1 drachm
Methylated alcohol	1½ ounces

Each drachm contains nearly 20 grains of pyro.

Dilute as required for the plates you use, but leave out of your formula any nitric or citric acid it may contain, as the formic acid replaces them.

* Read before the Glasgow and W. of Scotland Photographic Association.

Notes.

An artist who recently exhibited a "Study of a Cat" at Burlington House has had to acknowledge that the title was a misnomer. It was in reality a study of one of Mr Pointer's photographs, and very good indeed was the copy.

The exploring expedition cannot be considered to be well equipped now-a-days unless the camera is taken to put on record that which is visible to the eye, and the phonograph is taken to note down that which the ear perceives. When Herrn Tentgraff and Chavanne bring back with them a good supply of phonograph casts, and care is taken to reproduce these in a more durable material than tin-foil, we may have a combined photographic and phonographic display, in which the roar of the lion, the hiss of the

serpent, the chatter of the native, and the rush of the cataract, may accompany the exhibition of photographs on the screen. Still, some mechanical developments of Edison's talking machine must be made before all this is quite easy.

Mr. Anckorn's idea of showing three poses of the same individual on one carte, and forming what he calls a "triplet" photograph, was referred to a few weeks ago, and we now reproduce one of the triplets, as a Meisenbach block.

If we may judge by a circular, an attempt is to be made to hold an International Exhibition at the Alexandra Palace during the coming year; but it is regretted that the wording of the announcement is such as to lead many persons to confound the new venture with the International Inventions Exhibition of next year; and it is not quite easy to divest oneself of the notion that the promoters of the Alexandra Palace scheme do not very strongly object to this confusion as to the two exhibitions.

We had an opportunity the other day of taking a ramble through the exhibition buildings at Kensington, and a busy scene presented itself—the removal of some of the heavy exhibits involving the free use of pick and shovel to clear away the foundations or supports of masonry or brick.

Many exhibitors almost declined to remove their stalls, in the hope that they might be allowed to remain for the next exhibition; but the authorities have wisely determined to admit very few of such exhibits as have run through the Fisheries and the Healtheries, so the old exhibitors are now finding that their stalls will soon be removed for them.

Under these circumstances there was a great demand for photographers, but the exhibition authorities have ceded to one firm the exclusive "right" of photographing in the exhibition, so several arrangements made between exhibitors and photographers had to be cancelled.

Shall we confess? The companion who was with us carried a camera, the usual tell-tale stand being no tell-tale, as the legs folded in four. Our friend wished to secure a few photographs of the only quiet section of the buildings—a part fenced off by barriers marked "no admission," and placed under the charge of a representative of law and order.

An authoritative knocking at one of these barriers soon brought the helmeted guardian to us, and in reply to the question, "Which way in?" he indicated a small and previously-unnoticed door. Before long, however, a polite gentleman appeared on the scene, and mildly suggested that he represented the firm having the sole right to photograph in the building; but the worker at the camera boldly declared himself to have a proper authority—"indeed, would you like to see it?" he said, putting his hand into his pocket. "N-no, thank you," responded the polite gentleman, and went. As all the plates had now been exposed, the representative of law and order was saluted, and two persons might have been seen leaving the exhibition without staying very long to look around; but one remarked to the other: "I have never failed in a case like this; 'assume a *permit*, if you have it not.'"

The system of granting exclusive "rights" to photograph or otherwise reproduce educational collections made at the public expense is a very bad one, and, moreover, peculiarly English; as on the Continent of Europe it is usual to give great facilities to such persons as may desire to photograph or otherwise copy works of art in public collections, and special assistance is almost invariably rendered when the reproductions are intended for publication. There is nothing very surprising in this, as it may reasonably be considered that objects of art or exhibitions belonging to the public ought to be so used as to promote the culture of the people at large.

Our readers will recollect the great scandal which arose from the exclusive "right" formerly given to photograph at South Kensington Museum, and there seems likely to be a repetition of this scandal in connection with the National Gallery, those facilities to photograph the pictures, which were given to a German firm, being refused to an English art-publishing house (see page 739).

The Belgian Society has been invited to arrange an exhibit representing the actual condition of photography, at the Antwerp International Exhibition; and why should not the Photographic Society of Great Britain be asked to do something of the kind at our own Inventions Exhibition?

The *World* is much exercised in its mind concerning a photograph hanging in the Scarborough Station. The photograph is that of Lord Frederick Cavendish taken after death, and bears the announcement, "As done for Lady F. Cavendish and other members of the family." The *World* terms the photograph "an outrage upon good taste, if not common decency." As we have not seen the picture in question, we cannot say whether the remarks of our contemporary are justified.

The practical nature of the union between photography and bicycling will be shown at the next social meeting of the Temple Bicycle Club, when there will be a lantern exhibition, the slides for which will be confined to the work of the members.

The very animated discussion that followed the reading of Mr. Nesbitt's paper on "Collodion Emulsions" (see page 743) indicated the considerable value of the communication, and we are glad to find so much interest still taken in the subject. The present opportunity enables us to draw especial attention to the series of articles on "Lantern Slides," which was commenced in our last volume, and particularly to that article on page 818 of the last volume, and to articles which appear in the present volume (pages 401 and 721).

Mr. Francis Galton has not been slow to adopt our suggestion that he should give his opinion on the value of the "identiscope," a description of which we gave a few weeks ago. Mr. Galton, in a letter to the *Pall Mall Gazette* (which, however, only gives extracts from Mr. Galton's communication) doubts whether the fact of two genuine portraits blending harmoniously into a single resultant is "stringent evidence" that the portraits refer to the same person. He holds that the reason why photographic portraits blend so well together is that they contain no sharp lines, but only shades; that the photographic print of the iris of the eye does not afford a trustworthy unit of measurement; and that there would be no difficulty in selecting photographs of many different persons which should harmonise with the photograph of the claimant, a member of the Government ("Sir William Harcourt?" asks the *Pall Mall*), to wit.

To these objections the originator of the identiscope rejoins that the photographs are life sized, and when the combinations of the identiscope are projected upon a 24-feet screen, not a vestige of discrepancy appears in the admeasurement of the perpendicular. He also states that a complete section of one of the faces was removed, yet the parts were perfectly restored by the agency of the other portrait. The word "blend," says Mr. Matthews, is to "confuse"; the photographs in the identiscope perfectly "combine," but they are not "confused." As Mr. Galton presumably has neither seen the identiscope nor its results, it may be supposed that up to the present Mr. Matthews has the best of the argument.

If, in accordance with the recent decision at Nottingham (page 720), photographing a person against his will is to be regarded as assaulting him, curious complications of a similar character may arise, and whoever presents the camera in the direction of another person will run the risk of being roughly used, or having his apparatus smashed, so that photographing in the streets may some day become rather dangerous work; and as there may be little or nothing to show whether a camera is loaded with a plate or not, any one at whom the instrument may be levelled would certainly be justified in assuming it to be loaded.

To those who remember the old exhibitions of the Photographic Society, the change which has come over the relation between portraiture and landscape work is very remarkable. At one time portraiture absorbed at least three parts of the space, and landscapes occupied only a subordinate position. And the portraitists vied with each other as to who could produce the largest, and, it must be confessed, the ugliest pictures. Even a prize was on one occasion offered for the best large-sized head taken direct, and the result was certainly a collection of what would now be called monstrosities. Certainly size is not now regarded as a point of excellence, and so far we have progressed.

The International Congress for the protection of artistic and literary copyright has just held its seventh session at Brussels, and the Belgian Agricultural Minister has promised to introduce in the next session of the Belgian legislature a Bill to protect the rights of artists and authors. It will be interesting to see whether this Artistic Copyright Bill will have more success than the Bills for a similar purpose have had in England. Four Bills have been introduced within five years, and each has been dropped, and the question, more especially as regards photographs, is as far off as ever.

At the last meeting of the Royal Microscopical Society, a fitting tribute to the memory of Dr. Woodward, the eminent photo-microscopist whose death we alluded to some weeks ago, was paid by Mr. Beck. In the course of his remarks, Mr. Beck said that Dr. Woodward had the advantage of working under a Liberal Government, who provided him with apparatus suited to his requirements, and he thus possessed a magnificent collection of object-glasses, which he well knew how to use, as the beauty of his photographs abundantly testified. As it is so seldom an English Government is praised for its assistance toward scientific research, the circumstance is worth noting.

Plush for the borders of frames for photographs are, so a trade paper informs us, in greater favour than ever this season. It is satisfactory to know on the same authority

that vast improvements have been made in the manufacture of this material, both in its lasting and ornamental qualities. It is open to question, however, whether the photograph gains by these plush borders.

Patent Intelligence.

Applications for Letters Patent.

14,885. John Robert Sawyer, The Autotype Works, Ealing Dene, London, W., for "An improvement in photographic engraving."—Dated 12th November, 1884.

Specification Published during the Week.

114. Henry Vander Weyde, of Regent Street, in the County of Middlesex, Artist, Electrician and Photographer, for "Improvements in producing vignetted photographs." Dated 1st January, 1884.

My invention consists in the employment of a translucent or reflecting screen or screens interposed during exposure between the negative and the sitter or object being photographed, the shape of such screen being determined by the form of gradations desired.

In order to enable one skilled in the art to use my invention, I will now describe the operation. I place my sitter and proceed to take a head and bust portrait. Having posed, lighted, and focussed the sitter, I place the screen well out of focus, either outside the camera between the sitter and the lens, or inside the camera between the lens and the negative. If I use it inside, I construct the screen of a translucent material with an aperture in the centre. The material may be gauze or net or other open work fabric or tissue paper, or opal glass or other translucent material, the aperture being sufficiently large to allow the image of the head and the top of the shoulders to be transmitted uninterruptedly to the negative. The edges of the aperture may be graduated of different thicknesses or density, or the edges of the aperture may be jagged, the effect aimed at being to obtain a soft vignette into half tones extending to the very edges of the focussing glass. I then give the negative the ordinary exposure, and develop as usual. If the screen be placed outside the camera I may use either a translucent or opaque material; if translucent, I fashion it in the same manner as that just described, but on a much larger scale, as it is placed much nearer the sitter. Or I may use a reflecting instead of a translucent screen, of a white or light-coloured though opaque material, such as white cardboard, or white opal glass or metal. The reflecting side should face the lens, its surface being exposed to either direct illumination or to reflected light from a mirror or mirrors suitably arranged. In this case the edge of the mask nearest to the centre should be cut in the form of long V-shaped teeth.

1st. The herein described process of producing a vignetted photographic negative graduated off into a light or half tone, by the interposition, during exposure, between the lens and the sitter or object being photographed, of a translucent or reflecting screen or screens having an aperture of suitable shape and dimensions, substantially as herein specified.

2nd. The herein described process of producing a vignetted photographic negative graduated off into light or half tone, by the interposition during exposure between the lens and the sensitive surface of a translucent screen or screens, having an aperture of suitable shape and dimensions, substantially as herein described.

3rd. As a new article of manufacture, a vignetted photographic negative, graduated off into a light or half tone, substantially as herein described.

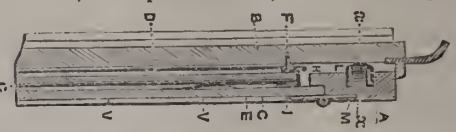
Patents Granted in America.

307,559. Hieronimus Mader, Isny, Wurtemberg, Germany, "Box for changing photographic plates." Filed June 13, 1883. (No model.) Patented in Germany Sept. 6, 1882, No. 22,569; in Belgium Jan. 16, 1883, No. 60,184; in France Feb. 14, 1883, No. 153,704, and in Austria-Hungary April 20, 1883, No. 5,045 and No. 16,709.

Claim.—1. The combination, with a shield and its slide, of a plate-holder fitting in the shield, and pins projecting from the outer surface of the slide of the plate-holder, the said pins being adapted to pass into apertures in the inner surface of the slide of the shield, substantially as herein shown and described, and for the purpose set forth.

2. The combination, with the shield and its slide, of a door in the back of the shield, and a plate-holder provided with a slide having devices for holding it to the slide of the shield, substantially as herein shown and described, and for the purpose set forth.

3. The combination, with the shield A, provided with the door U and its slide B, of the plate-holder C, and the slide D, provided



with pins F, entering sockets in the inner face of the slide B substantially as herein shown and described.

4. The combination, with the shield A, the slide B, and the plate-holder C, of the spring-pressed slide D, substantially as herein shown and described.

5. The combination, with the shield A and the slide B, of the plate-holder C, and the slide D, provided with the ledge H′ and the pins F, the slide L, and the spring M, substantially as herein shown and described.

6. The combination, with the plate-holder C, provided with the guide-grooves H, and the slide D, provided with the ledge H′, of the cap K and the springs S, substantially as herein shown and described.

COLLODIO-CITRO-CHLORIDE.

BY CAPTAIN ABNEY, R.E., F.R.S.

I have been asked several times lately how a collodio-citro-chloride emulsion is to be made when using citrate of ammonia instead of citric acid as the organic body necessary to combine with silver, which is to give vigour to the printed image. It is very easy to do, however, by a little artifice which I have thought might be worth describing. Citrate of ammonia is insoluble in alcohol, and therefore rather difficult to introduce into an emulsion in the ordinary manner; but it can readily be introduced into collodion by the following procedure. Take ten grains of pyroxyline and cover it with half an ounce of alcohol in which twenty grains of citric acid is dissolved, and then add one ounce of ether. This forms collodion containing citric acid. In order to get citrate of ammonia into the collodion in a very fine state of emulsion, ammonia (gas) dissolved in alcohol is added to the collodion. This is effected by inserting a bent tube in a cork in a test tube, which is a quarter filled with liquor ammonia. Placing this in warm water—in fact, nearly boiling water—the ammonia is given off rapidly, and can be made to pass through alcohol contained in another test tube. The alcohol absorbs the ammonia and takes up a large proportion of gas, as those who use sal-volatile may be aware.

This ammoniacal alcohol is next added to the collodion containing the citric acid, little by little, with shaking and stirring, and sufficient is added till reddened litmus paper shows a very slight trace of alkalinity. A very fine emulsion of citrate of ammonia is thus formed, the grain of which is indistinguishable by the naked eye, and, like other emulsions when first mixed, is orange-coloured when spread upon a glass plate. The emulsion is again rendered slightly acid by the addition of a few drops of a solution of citric acid in ammonia. If an emulsion of citrate of silver be required, there are two ways of effecting it—one by dissolving (say) ten grains of silver nitrate in the least possible quantity of water, to which is added one drachm of alcohol, and gradually dropping it into the collodion containing the citrate. It sometimes happens that this gives a granular emulsion. If, however, the silver nitrate be coarsely powdered and added to the emulsion, a very fine emulsion of citrate of silver is produced by shaking. This may be washed in the usual way, or may be precipitated by pouring in a fine stream into water. Another method of forming the citrate of silver is to pour out the

emulsion of citrate of ammonia into a flat dish, and when well set, to cover it with a solution of silver nitrate. It is then drained from the silver, washed, and dried as usual. When re-dissolved, the emulsified citrate of silver should be excessively fine.

To prepare a collodio-citro-chloride emulsion, two plans may be adopted: either to dissolve twenty grains of dry calcium chloride in a small amount of alcohol, and add it to the citrate of ammonia emulsion, and then to add 80 grains of silver nitrate to it in the usual way. What I prefer, however, is to make a collodio-chloride emulsion separately, and then to mix the citrate of silver emulsion with it, according to taste.

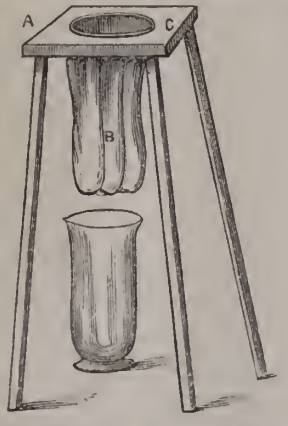
To make a pure collodio-chloride emulsion, I dissolve twenty grains of calcium chloride in half-ounce of alcohol; add to it five grains of pyroxyline, and then half-ounce of ether. To one ounce of plain collodion made similarly, I add sixty grains of silver nitrate dissolved in the smallest quantity of water, to which is added one drachm of warm alcohol. This produces an emulsion of silver nitrate in the collodion. To this the chlorized collodion is added drop by drop with stirring or with shaking in a bottle, and a perfect emulsion of silver chloride should result. This can be poured out to set in a dish as usual, and washed, dried, and re-dissolved; or can at once be poured out in a fine stream into a large bulk of water, squeezed, soaked in alcohol twice, wringing out in a cloth all excess of alcohol each time. It can then be re-dissolved in the one ounce of ether and one of alcohol, and should give a good emulsion. The two emulsions may then be mixed together as before stated. It is well to dissolve about five grains of silver nitrate in water and alcohol, and add to the emulsion in order to increase the rapidity of printing.

I propose to refer to the printing and toning of collodio-citro-chloride in a subsequent communication.

ON FILTERING GELATINOUS MIXTURES.

BY LIEUT.-COLONEL W. L. NOVERRE.

A SIMPLE and rapid method of filtering gelatinous mixtures will doubtless be acceptable to many photographers. The plans usually recommended are, the use of a funnel plugged with tow or cotton-wool, or a piece of cambric or other material spread over a jar, on which the solution is poured and allowed to percolate through. These plans are altogether unsuitable where large quantities of liquid have to be filtered, and even for small quantities the process is slow. The gelatine has to be kept warm till the operation is complete, and a rather open material must be employed, or the



solution will only fall through drop by drop. The plan here described will be found very expeditious, there is no waste, a filtering material of the closest texture may be used, and the warm mixture is filtered before it has time to thicken by cooling. It has been used successfully for filtering gelatino-bromide emulsions and the gelatinous mixtures employed in the preparation of carbon tissue. The arrangement referred to is shown in the annexed cut. A is a wooden stand 18 inches high, having a hole in the top four inches in diameter; C is a ring made of bent cane or whalebone, slightly larger than the hole in the stand. The filtering material, which must be of the closest texture, should be cut in a circular form about 22 inches in diameter; when secured to the ring with stout thread it forms a bag B, the ring C preventing it from falling through the opening in the stand.

To use the apparatus, the operator pours sufficient of the mixture into the bag to half fill it; he then seizes the bag, above the liquid, with his fingers, and presses the filtrate through into a receptacle placed below to receive it. Further portions of the mixture are poured in till the whole quantity has been filtered. With the measurements given above, quantities varying from 4 ounces to 40 ounces may be readily operated upon.

A WEEK IN SUFFOLK.

BY JOHN L. ROBINSON.*

THE ordinary Irish tourist in England generally confines his attentions to the large towns or fashionable watering places, and misses all that is most attractive to the lovers of art and nature. The quiet villages, the quaint cottages, the picturesque churches, cosy manor houses, and lordly mansions lie outside the ordinary routes of tourists. Visit an old cathedral town such as Worcester, or seat of an ancient monastery such as Shrewsbury or Bury St. Edmunds, and you will find that the towns themselves and the surrounding country will furnish a thousand subjects for the pencil for the artist or camera of the artistic photographer.

It has been my good fortune for the last five years to have had opportunities of exploring rural England. My first visit in 1880 was to Norfolk, the home of the wild duck and sportsman: where, like in Holland, the eye may wander for miles and see no other object than the meres and the towers of the many churches scattered so plentifully through that district. From one spot in Norfolk no less than thirty-six church towers may be counted, all built towards the latter end of the 15th century.

This year our party returned to East Anglia, and made Bury St. Edmund's our head-quarters. The 112 photographs which I exhibit to-night were, with the exception of the six Cambridge views, all taken by me during the week beginning the 11th, and ending the 16th of August.

This was the fifteenth excursion of the Architectural Association, a body comprizing 1,000 members. The excursion is limited to 38 or 40, and the details are previously arranged by a sub-committee. My thirty-seven companions sketch in pencil, water-colours, or ink, whilst I am the only photographer of the party; in several of the views my companions may be seen hard at work—in fact, taken in the act.

So much for the preliminaries. I was armed with one of Swan's 8½ by 6½ cameras with three double backs, and Hare's 5 by 4 camera with changing box for twenty-four plates. I was then enabled to take thirty views a day, as I also had a supply of four dozen whole plates, and a gross of 5 by 4. Each night, after dinner, by help of a ruby lantern, the day's plates were taken out of the slides, and changing-box filled with fresh ones for the next day; the former being packed in the latter's boxes, and sealed and labelled. I also notice in a book the number of plates taken at each place, which, together with pencil sketches made on the spot, enabled me to identify the views on development. I was very much troubled on my first excursion to notice the views, as all the churches got mixed up in my mind, and could only be identified by my sending prints to my sketching friends, who recognized the views.

On my way to Bury, on the previous Saturday, I visited Cambridge, and secured six views in and about Trinity College, for which I had to obtain permission. They are numbered 33 to 37. The old road shown in 33 and 34 is very beautiful, as may be seen from the photographs.

Sunday was devoted to devotion and strolling through the town; but two sets of enterprising individuals made carriage excursions to places not included in the coming week's work,

* Abstract of a paper read before the Photographic Society of Ireland,

with poor results, as the porch at Foston Church. (No. 38, taken at half-past seven in the evening) is all that I can show for my Sabbath breaking.

Our excursion proper commenced on Monday morning, and after breakfast, at eight o'clock, we left Bury at nine, arriving at Mildenhall (near Newmarket) at 10.50. The church here is illustrated in views 7, 8, 9, and 39 and 40, and is remarkable for the beautiful carved oak roofs on nave and aisles, which, I regret to say, seldom show distinctly in a photograph. The church is built of flints and stone, which are arranged to form tracery or chequer work in the walling. No. 41 is a view of the quaint market cross covered with lead. There is also a manor house of no great interest. After remaining two hours at Mildenhall, we left for Ichlingham, where we arrived at 1.30, devoting an hour to the interesting church, now disused; the nave and porch are covered with thatch, and are illustrated in Nos. 42, 43, and 44. After an hour's sketching, we left for the manor house of West Stow, with a very good entrance of brick and terra-cotta, beautifully mellowed by age, which I was unable to photograph, as the light was against me. The sailor and others may steer very close to the wind, but we photographers must keep the sun on our side or at our back if we do not want to have him peeping over the tiles and roofs, and looking into our cameras; I, however, secured a general view (45), and two interiors (46 and 47), the latter being a curious fresco on the wall of the room of the four (not seven) ages of man. The first is a youth, with a falcon on his wrist, and the legend, "This do I all the day." The second is a young man embracing a girl, and saying, "This do I while I may," and an old man further on, pointing at the last, exclaims: "This did I when I might"; and the last scene in this strange eventful history is a slippered pantaloon on crutches exclaiming, "Good Lord! will this world last ever?"

At 8.40 Morgan Hall, the seat of Lady Gaze, was reached, and two hours spent in sketching the details of this spacious Tudor mansion, which is illustrated in views 10, 11, and 12.

On Tuesday I secured views of Wetherden Church (50), a typical church of the district, built of flints, with a square tower at the west end. 51 illustrates the elaborately carved oak bench ends, with grotesque animals seated on the elbow rests of each; and 52 is the west door. Woolpit Church came next on our list; it has a stone spire (No. 53), and a very elaborate south porch (13 and 54). A view of the cosy rectory is given (No. 55), embowered in clematis, with sunflowers 8 ft. to 10 ft. high in the garden. Rattlesden Church has also a beautifully carved south porch (59), and font (58). The Church has a spire covered with oak shingles. Rushbrook Hall, standing in a beautiful demesne, and surrounded by a moat, is illustrated.

On Wednesday we visited another moated manor, Kentwell, of earlier date (20, 70, 71, 72, 73, 74), of which I have secured six views, and two of the finest Churches seen during the week.

Nos. 21, 22, and 82 illustrate Hawstead Church, visited on Thursday; and Stanninfield Church (83 and 84). Coldham Hall (23 and 24), a large red-brick mansion, is interesting on account of the secret rooms and means of escape contrived in the walls.

Plumpton Manor is to be seen as a background for our group (No. 25), graced with the presence of the ladies of the house. The house dwells in our memory far less for its architecture, than for the kindness and hospitality of its owner, Mrs. Bevan.

The church of Little Saxham, with a Norman round tower, was visited on our return to Bury, and also Jekworth, a stately mansion founded by a Bishop of Derby, now the seat of the Marquis of Bristol, who also entertained the visitors with noble hospitality; views of Jekworth are given (No 87 and 88).

On Friday, we visited the churches of Packenham and Inworth, the Manor House of Bardwell (29) and Church (30 and 31). Also Stowlangtoft Church and the very fine Church at Walsham Willows are fully illustrated.

When we awoke on Saturday morning with "Auld Lang Syne" ringing in our ears, our festivities did not reduce the number who mustered at the Abbey Gate, Bury at 9.30. They may be seen in No. 1, preparing to do Bury, which we did, inspecting the ruins of what was once the finest abbey in England. No traces of the Abbey remain, except the gateway and the Abbots Bridge, a structure illustrated in Nos. 2, 100, 104, and 105. There are also two very fine churches, St. Mary's and St. James's.

TELESCOPES FOR ASTRONOMICAL PHOTOGRAPHY.*

Before giving any suggestions as to the best kind of telescope to use, and the best methods to follow in the application of photography to astronomical observation and record, it may be more convenient to mention briefly what can be done in this way, particularly as the subject will be new to many who have not followed closely what has been recently done.

I wish to mention (1) That photography has now shown itself capable of giving us pictures of nebulæ that are superior to those made by eye and hand. (2) That anything that can be seen by the eye with a telescope of a certain size can be photographed, and, further than this, stars that are too faint to be seen in this telescope can yet be photographed by it with sufficient exposure. (3) That portions of the heavens of several degrees extent each way can be photographed, and stars therein of a magnitude smaller than that shown on the best existing charts or maps, pictured in their proper relative positions and magnitudes in a quicker, better, and more accurate manner than by the plan hitherto used. (4) That it is possible thus to make a complete series of such pictures embracing the whole heavens, that will be practically free from human error. (5) That each individual nebula, cluster, or group of stars, can also be taken on as large a scale as possible, and form a supplement to the picture-maps on the smaller scale. (6) That though such pictures may differ slightly from the eye observations, owing to the different colours of light not affecting the eye and the sensitive plate in the same manner, they would have the enormous advantage that they could be compared directly with other pictures, taken after the lapse of any number of years, under conditions that there would be no difficulty in making almost identical. (7) That there are other applications of this new power, as in direct enlargements of the surface of the moon piece by piece, of the planets, of double stars, and close clusters; and indirectly in the discovery of planets, either major or minor, by the simple process of direct comparison of star pictures taken at intervals, when the actual position of a planet will be recorded at each date. If there be a planet beyond Neptune, such a plan as this is, perhaps, the only way to detect it, especially if it is now near the Milky Way, where stars of its probable magnitude cluster so thickly that no process other than this could be used to chart the stars and detect movement. If these things can be done—and I most confidently say they can—then it must be admitted that nothing short of a revolution in observational astronomy must result, to the enormous gain of astronomy.

I speak relying entirely on my own work and experiments, which I shall refer to in detail further on, and I am strengthened in my opinions by what I hear has been done in a similar direction elsewhere, though I have not, except in one case, seen any of the actual work done.

The possibilities that are thus opened out really border on the marvellous. As has already been said by some one else, a library may now be made, not of books full of descriptions and figures, the accumulated work of many men working many years, each on his own system, but of pictures written on leaves of glass by the stars themselves.

Such a work will mark an epoch in astronomy, and its value increase as long as astronomers exist. No one can doubt for one moment the importance of such a work, nor the fact that, now it is possible, any delay in doing it will be a direct loss to astronomy. How it is to be done—whether by the slow process of letting it be done by the disjointed efforts of many amateurs of astronomy, or by being properly taken in hand and finished by united effort and proper means in the course of a few years—remains to be seen.

I propose to make some suggestions as to the practical part of this work in the selection of the best kind of telescope and mounting, the methods of working, the work to be done, and some other matters in connection. The most important matter is no doubt the selection of the best instrument to work with. Of the two kinds of telescopes now in use, the reflector seems to be the most suitable for this work, though a reservation may be made in favour of the refracting principle where large fields on a small scale are required. Both kinds of telescopes when of moderate dimensions—that is, not more than 18 inches aperture—are so nearly alike as optical instruments, that the chief distinction worth noting—neglecting for the present one or two points where they differ, and altogether such points as are rather matters of individual prejudice on the part of the

* *Nature*

observer, than qualities or defects in the instruments—is that of cost, the reflector being very much less expensive to make. It is true that the refractor has been hitherto generally considered the most satisfactory in use, and has been preferred when expense has not been a consideration of importance. I think this may be rather due to the greater care that is bestowed upon the more expensive instrument, both in the making of object-glass and the mounting, than to any real difference that there is between them. The first cost of the raw material alone differs immensely. For the reflector one disc of glass alone is required, and if it is only properly annealed it need not be optically pure. There is only one surface to work, though it is of importance that this should be properly figured; this is not a difficult matter, yet there is little doubt it has often been very imperfectly done in many so-called reflecting telescopes.

(*To be continued.*)

A METHOD OF TESTING FOR IODINE IN THE PRESENCE OF LARGE QUANTITIES OF BROMINE.

BY PHILIP S. BRITO, M.B.,

Late Demonstrator of Anatomy, Aberdeen University, and Science Student, University of Edinburgh.

When engaged in analytical work in the Chemical Laboratory of the University of Edinburgh I discovered the method of testing for traces of I. In the ordinary process of analysis, from a solution supposed to contain Br or I, we liberate the halogen by the aid of small quantities of chlorine, and carry it down with chloroform. The violet colour of I, or the dark sherry-brown of Br, picks out the element. But in a mixture containing both, the colour of the less abundant halogen is masked. When I preponderates it is got rid of by the addition of $CuSO_4$, and H_2SO_3. When, however, the Br is in very great quantity, I find that the addition of a crystal or two of $FeSO_4$ completely decolourises the brown colour, and renders visible the minutest traces of I dissolved by the chloroform. The value of this test may be gathered from the fact in the KBr supplied as a reagent in the laboratory, and which is supposed to be pure, the application of the $FeSO_4$ crystals demonstrates the existence of a trace of I as an impurity. Further, when the colour aloue is not decisive, and auy doubt exists, its application will settle the point. The behaviour of the Br is probably due to the oxidising power it possesses in common with its sister Cl. How far the decolourisation can be taken advantage of to determine volumetrically the amount of Br in a given exercise can be settled by actual experimentation. However, the ferrous sulphate method when used as a qualitative test works well, and my fellow-students and I have never found it to fail, so that although it transpires that the method is not new, yet if this contribution succeed iu directing attention to it I shall have done some slight service towards the furtherance of chemical knowledge.—*Chemical News.*

THE TROUBLES OF MR. MELANDER.

Anthony's Bulletin makes the following remarks iu reference to Mr. Melauder, who is the mouthpiece of some Western photographers in their complaiut against amateur photographers:—

"Amateurs in the true sense of the word take up the art from a pure love of it, and practise without a consideration of reward. But everyone understands, who knows anything of the universal rules governing the standing of amateurs in any branch of the arts, sciences, or of sports, that the moment one receives money for a performance, product, work of art, or it matters not what, he ceases to be an amateur, and becomes a professional.

"Surprising as it may seem, the number of these so-called amateurs among Mr. Melander's clients has become very large. Boys, with ten dollar outfits, are proposing to do portrait work, and, what is more to the point, actually take the orders and execute them at prices which pay little more than the cost of the plates and the ready sensitized paper on which they are printed, to say nothing of the cost of the mounts. Then, with a "cheek" that is phenomenal, they have in more than one instance asked Mr. Melander to burnish their work; sometimes assigning as a reason that the work is for one of his customers. Of course this class of work disgusts the customer, and he is likely to come and order another dozen or two from the gallery; but here is where the worst of the trouble begius to be felt. He says: 'I know what these things cost. You ask too much. Paper is worth so much, gold is so much, aud a graiu will tone a sheet; I caunot afford to pay you the old prices. I have a young friend in the business, and I know all about it.'

"Under such circumstances it is difficult to argue with a man; and, while it is sufficient to say that these are prices from which one cannot vary, the patrou is dissatisfied, and will probably take the first opportunity to go elsewhere for work. With such cases occurring from week to week, it is not difficult to see why, not only Mr. Melauder, but many other photographers in the West, have no love to lose for the renegade amateur who begins *business* as soon as he is able to make a development and print a picture."

Mr. F. C. Beach, the able President of the Amateur Association of New York, tells the story of a non-professional photographer after Mr. Melander's own heart.

"A gentleman spent his summer vacation uear a country village, in which was a resident photographer barely able to earn his support; while taking pictures, attracted by operating his instrumeut, many persons asked him to take their photographs, and what they cost. He always told them he would take a negative, and as it cost so little he would charge them nothing. He would make them a present of the negative, and if they wished auy prints they could deliver the plate to the village photographer, who would accommodate them. He had previously advised the protographer to charge a good price for the work. In a short time his orders became so plenty that he was soon placed in very comfortable circumstances. Thus it was shown that while there may appear to be an antagonism between the professional and amateur, he frequently renders to the former substantial benefit."

Correspondence.

EXHIBITION AWARDS.

Sir,—I have to call your attention to the extraordinary action of the Photographic Society of Great Britain in respect to the medal offered for lantern slides at the late Exhibition. The medal has been awarded to Mr. Gale. I have written to the Secretary to protest against it on the following grounds:—

1. That the slides exhibited by Mr. Gale were not qualified for competition.
2. That if they were, they were not worthy of the medal.
3. That they were uot submitted to the whole of the jurors.

The first of these objections is founded upon the conditions under which the medal was offered, that the slides for competition should be sent in by a certain date.

They do not appear in the original uncorrected catalogue, or in the second corrected edition. I am also in a position to show that they were not in the possession of the Society, at any rate, up to the 6th October, 1884, the day upon which the Exhibition was opened to the public. A series of slides by Mr. Gale was exhibited on the screen on that evening, I believe, but they were not the slides which were afterwards shown, and for which the medal was awarded.

The second objection applies, of course, still more forcibly to the first series of slides which were shown on the screen as Mr. Gale's, as they were in every respect far inferior to the final selection. I wish to give Mr. Gale every credit for the real artistic feeling which dictated these slides, but affirm that their technical defects were sufficieutly great to render them unworthy of the distinction of a medal.

As to the third objection, I am in a position to prove the facts. To this the Photographic Society may reply that the medals awarded to Mr. Gale and Mr. McKellen were extra medals. To this I should have uo objection whatever if *the* medal had been awarded for the slides actually sent in for competition. It is absolutely impossible for anyone knowing anything at all of the subject to deny that there were at least ten frames of slides, which were entered strictly in accordance with the regulations, worthy of a medal.

The fact is, that I (and I believe all the other exhibitors without exception) feel deeply aggrieved at the want of consideration or common courtesy allotted to us by the entire management of the lantern show both last year and this. Professional slide makers know that the optical lantern must become the great educational instrument of the future, and sent their slides in for exhibition on the faith of the Society's prospectus, fully expecting that their merits would be fairly judged, and that the public would thereby become acquainted with the progress made in so very important a branch of photography. Neither they nor the public wanted that ridiculous nightly apology for diverting the Society's lantern from its special purpose (of spectrum analysis in connection with photography!) to the comparatively base use of showing photographic transparencies.

The conditions laid down, that the negatives and transparencies should be the work of the same operator, were extremely ill-advised. The proof is that the exquisite slides by Mr. Brooks from Mr. Donkin's negatives would have been thereby shut out. The complete absence of all other conditions shows either consummate ignorance of, or utter indifference to, the great importance of the class. However, many excellent slides were sent in for competition, strictly in accordance with the Society's conditions, and the manner in which their claims have been ignored is an unpardonable insult to others besides

your obedient servant,
GEORGE SMITH.

26, *Colebrooke Row, N.*

SIR,—Considering that but few expressions of real discontent have appeared in the PHOTOGRAPHIC NEWS as to the distribution of medals at the late Photographic Exhibition, and that many have expressed their satisaction, it is almost needless for me to say anything on the subject. Still I must own that I agree entirely with the present excellent way of judging, and think that it is much to be preferred to the old way of the judges meeting together, choosing the dozen or so best pictures, and then awarding medals to several out of these. To say the least, the new method is very much fairer than the old.

While writing this, I can quite see that out of such a number of fine subjects it is extremely hard—nay, impossible—to please everybody; but I cannot help feeling that in this year's show there is far less ground for discontent than ordinarily.

A NON-EXHIBITOR.

[The London Exhibition being closed, the paper war between contented spectators and disappointed exhibitors had better stand over till next year. Possibly some novel point may then be raised.—ED. P. N.]

SPOTS ON PRINTS.

SIR,—Some proofs on albumenized paper that have been left some time without being mounted on cards get covered with little perfectly round white spots when they are damped for mounting. French photographers call this *petite verole*. Is the cause known? You would much oblige us by submitting this question to the numerous readers of your interesting journal.

Oporto, 11th November, 1884. A. A. P.

THE HYROXYLAMINE DEVELOPER.

DEAR SIR,—I should be obliged if you would permit me to explain more fully a rather important point raised by Mr. Warnerke in the discussion on my paper. The question was asked: Is hydroxylamine as powerful a developer as pyrogallic acid? In answer I stated that when using a solution containing the same proportion as alkali, pyro was certainly more powerful; but that in the formula given, a much larger quantity of alkali was present than suitable for pyro development. Thus, with my formula, the hydroxylamine developer was practically quite as powerful as that of pyrogallic acid. In proof of this assertion, it is distinctly stated in the editorial notice, page 691, that "in the case of the plate exposed under the sensitomer, the same figure was got as with the pyro-developer." I may also state, in confirmation of this result, that a plate exposed with a drop-shutter last month, on development with hydroxylamine, produced a negative full of detail, and exhibited not the slightest hardness or other effects which too often are met with in so-called instantaneous photographs.—I am, sir, &c.,

ARNOLD SPILLER.

ELECTRIC LIGHT FOR THE LANTERN: CLEARING SOLUTION.

DEAR SIR,—Has the electric light been tried for the magic lantern? I read that the electricity can be bottled up! If so, why should it not be used for lanterns? What is the best and safest light to use for lanterns at home?

I see in your paper of Friday last, page 727, a paper read by Mr. T. Baynton, in which he says: "Use for a clearing solution: alum, 1 oz.; sulphuric acid, 1 oz.; water, 20 oz. I think this must be a mistake, as I use 1 oz. sulphuric acid, 1 oz. to 40 of water, and find if plate is left in over 20", it will destroy the film. He must mean ½ oz. to 20 oz of water.—Yours truly,

A. R. DRESSER.

[Although the application of the electric light to the demonstrating lantern is almost as old as the first use of the arc, the electric light has not yet been used in a general sense as a lantern light: we shall be glad to record the experiences of our readers in this matter.—ED. P. N.]

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 13th inst., Mr. A. HADDON in the chair.

The evening was occupied in discussing which process of making transparencies was the most suitable for ordinary work. The competing processes included collodio-albumen, wet collodion, carbon, Woodburytype, gelatino-bromide, gelatino-chloride, and gelatino citro-chloride. The same pair of negatives was used by each manipulator, in order to judge fairly the comparative results.

Messrs. C. and F. DARKER placed their oxyhydrogen lantern at the disposal of the Society, Mr. F. Darker personally superintending the arrangements.

Each transparency was shown upon the screen and its merits considered, the method of production being a secret; by this means a standard of excellence was arrived at which, in the end, resulted as follows:—River scenes—1, collodio albumen; 2, wet collodion. Figures—1, Woodburytype; 2, gelatino-chloride; 3, gelatine bromide (very slow emulsion).

An example of gelatino-bromide developed with hydroxylamine was shown by Mr. J. B. B. Wellington. The result, although good, was not considered quite up to the standard. The developer mentioned was hydroxylamine, 1 grain; caustic soda, 4 grains; ammonium bromide, 1 grain; water, 1 ounce. Twelve minutes were occupied in developing.

The CHAIRMAN considered it proved that good transparencies could be made by several processes.

Mr. COBB showed views on the screen of the Lord Mayor's procession; and

Mr. A. L. HENDERSON exhibited a picture showing the ceremony of laying the foundation stone of the Liberal Club, taken principally by electric light, with, he thought, the fastest plate ever made.

December 11th the subject will be:—"Avoiding Granularity in Copying," by Mr. W. E. Debenham.

CAMBRIDGE UNIVERSITY PHOTOGRAPHIC SOCIETY.

A MEETING was held on November 15th, Mr. SHAW, M.A., in the chair.

The minutes of the preceding meeting having been read and confirmed, the Chairman called on Mr. Elder to read a paper on the "Autotype Process."

Mr. Elder first gave a short historical sketch of the process, and then explained the different ways of working it. He also showed a great number of fine specimens which had been kindly lent by the Autotype Company.

A short discussion followed, and after a vote of thanks to Mr. Elder, and through him to the Autotype Company, the meeting adjourned.

Glasgow and West of Scotland Amateur Photographic Association.

The usual monthly meeting was held on Tuesday evening, 11th instant, Mr. High Reid (President) in the chair.

The following new members were admitted:—Messrs. J. R. Reid, David McSkimming, J. Bertram, James Lumsden, William Gray, John Conbrough, Archibold Auld, A. Brown, G. Logan, A. M. Donald, James Logan, and George Sheriff.

Mr. W. Goodwin then read a paper on "Isochromatic Plates," and passed round some very interesting results, which impressed the meeting very favourably. Mr. Goodwin also read a short paper on "A New Developer" (see page 743), and demonstrated the changes of colour before the meeting.

At the request of several of the newer members of the Association the President repeated his demonstration of the Platinotype Process, with great success. He gave all particulars regarding licence, paper, printing, &c., and developed a number of prints, which were distributed amongst the members present.

The nomination of office-bearers for 1885 was then proceeded with.

It was agreed that ladies be admitted members of the Association at a reduced rate, those joining in December to have the right of exhibiting at the forthcoming Exhibition in the middle of December.

Bolton Photographic Society.

The November meeting was held at the Baths, on the 6th instant, Mr. R. Harwood in the chair.

Messrs. J. Lomex, Junr., J. A. Walker, J. W. Walker, and R. Dickinson were elected members of the Society.

Dr. Johnson exhibited a number of prints from negatives taken during a recent visit to Norway.

It is intended to hold an "open" meeting on December 4th. Members were requested to bring as many good slides as possible.

Photographers' Benevolent Association.

On Thursday evening, 13th instant, the Exhibition of the Photographic Society of Great Britain was opened in aid of the Photographers' Benevolent Association, with a charge of sixpence admission; over 300 visitors passed the barrier. At 9 o'clock the Society's optical lantern was brought into use, and a series of most excellent transparencies were exhibited, Mr. Donkin, the Honorary Secretary of the Photographic Society, describing the different scenes. At the conclusion an admirable transparency of James Glaisher, Esq., president of the Society, taken by Mr. Mayall, was put upon the screen, and Mr. Thorne, in a short speech, informed the visitors that it was owing to the kindness of the President and Council of the Photographic Society that the Benevolent Association were receiving the benefit from the Exhibition and the use of the lantern, and asked them to join him in thanking those gentlemen, and also those who had very willingly lent the slides which they had seen that evening. The request was most cordially responded to.

Particulars regarding the constitution and objects of the Association may be obtained upon application to Mr. H. Harland, Secretary, 181, Aldersgate Street, E.C.

Leeds Photographic Society.

The ordinary meeting was held on Tuesday, November 11th, the alteration in the date of meeting being made so as to enable the members to spend the evening with Messrs. Bridge and Brooks, of the South London Society, who were in the town on that day.

The President (Professor Thorpe, F.R.S.) invited the members with Messrs. Bridge and Brooks to tea at the Yorkshire College. After an excellent tea, a vote of thanks to the President was proposed by Mr. J. W. Ramsden and supported by Mr. Teasdale and carried by acclamation. The members, under the guidance of Dr. Thorpe, then proceeded to view the various departments in the new College, and much admiration was expressed as to the completeness of its arrangements.

At 8 o'clock the ordinary business of the Society was commenced, Dr. Thorpe presiding.

Mr. J. W. Reffell (Treasurer) read the balance sheet of the Society, from which it appeared that £21 15s. had been received from subscriptions, and £11 19s.1d. expended in postage, printing, &c., leaving a balance in the hands of the Treasurer at the date the books were closed for audit of £9 15s. 11d.

Mr. Butterworth was elected a member.

The President then called upon Messrs. Bridge and Brooks to give their lantern demonstration.

The lantern, a triple oxy-hydrogen, was manipulated by Mr Brooks with his usual ability.

Mr. Bridge exhibited slides on gelatino-chloride plates, showing the different tones that can be obtained by this process.

Mr. Brooks—Slides prepared by his collodio-emulsion proces s

Mr. Pocklington exhibited some very peculiar effects obtained by toning gelatino-bromide plates with gold, nitrate of uranium, &c.

Mr. Ramsden—Transparencies on gelatino-bromide plates, own preparation.

Mr. J. W. Reffell—Transparencies on gelatino-bromide plates.

Photographic Society of Ireland.

The annual general meeting of this Society was held on Friday last, the 14th inst., in the Royal College of Science, Dublin, Mr. Herbert Bewley in the chair, when the report of the Council was presented, in which the Council announced a further increase of the Society, whose members now numbered 73, independent of those to be elected that evening.

A list of the papers of the session (which have appeared in these columns) was given; and allusion made to the varied collection of apparatus and photographic novelties that had been exhibited at the meetings, which, on the whole, had been fairly attended.

The annual lantern exhibition was held in March last, and was as usual a great success, all the pictures shown having been taken from negatives the work of members of the Society. It having been thought advisable to hold several short excursions on Saturday afternoons instead of the annual field day, arrangements were made, and Howth, Lucan, the Valley of the Liffey, and Glen Druid, were visited. The attendances at the last two of these meetings was not, however, sufficient to justify their continuance to the end of the season. The Council congratulated the members on having been the means of organizing the Photographic Exhibition now open, which, in the opinion of the Council, is one of the best collection of photographs which has ever been brought together; they feel confident that it cannot fail to elevate the standard of the art, and be of considerable service to photography in Ireland.

The report and statement of accounts showed a balance in hand of £50 8s. The report and statement of accounts were adopted. The President, Vice-President, Hon. Treasurer, Hon. Sec., and Hon. Assistant Sec., were re-elected for the coming year; as also the following retiring members of Council: Messrs. George Mansfield, Greenwood Pim, John L. Robinson, Thos. Mayne, Herbert Bewley, and E. P. Johnson.

Thanks were then passed to the Council of the Royal College of Science, for the use of their premises during the past year; and to the Council of the Royal Hibernian Academy of Arts, for having placed their premises at the disposal of the Society for the purpose of the Photographic Exhibition.

The following were elected members of the Society:—Messrs. S. Geoghegan, C.E., H. Magee, and Francis S. Hall.

Mr. John L. Robinson then read a paper entitled "A Week in Suffolk" (see page 747), being an account of the trip of the British Architectural Association for the present year.

Mr. Greenwood Pim (Hon. Sec. of the Exhibition Committee) announced the particulars as to the opening of the Exhibition on the 18th inst.

Sheffield Photographic Society.

The monthly meeting was held in the Masonic Hall on November 4th, Mr. W. B. Hatfield in the chair.

After the usual business of the Society, and previous to the special business,

The President made a few remarks on what he thought the best way of spreading useful and practical knowledge amongst the amateurs of the Society.

Mr. FOXEN then gave a lecture and demonstration on enlarging on argentic bromide paper. Two excellent enlargements were made from half-plate negatives, the light being an ordinary double-wick paraffin lamp and a tin condensor, a bellows camera and a whole plate Ross' symmetrical being used; the paper being pinned on an ordinary drawing-board.

The subject for the next meeting was announced to be "An Exhibition of Photographic Lantern Slides, and how to make them."

The meeting was one of the largest the Society has ever had.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next monthly technical meeting of this Society will take place on Tuesday next, November 25th, at 8 p.m., at 5A, Pall Mall East.

THE NEW ORLEANS EXPOSITION.—Steps are being taken to make photography very thoroughly represented at the World's Exposition to be held in New Orleans next spring, the north gallery and east section of the main building having been set apart for photography. The following committees have been appointed for the various divisions of work in the photographic section:—On photographic apparatus and requisites, Col. V. M. Wilcox; on education, history, and literature, Prof. C. F. Hines; on amateur photographic societies, Mr. E. F. Beach; on practical photography, E. L. Wilson. The latter gentleman has also been appointed Superintendent of the Photographic Department.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, on Nov. 26, will be "Forgotten Processes."

To Correspondents.

*** We cannot undertake to return rejected communications.

THOS. E. LANSOM.—1. Although not sold here, they can be obtained at most of the dealers in photographic apparatus in Germany. 2. First rub powdered French chalk on the glass, and wipe off the excess with a piece of soft rag; next collodionize with ordinary plain collodion, and then coat with emulsion in the usual way. When the negative is finished and dried, collodionize it with a tough collodion containing about twelve grains of pyroxyline to the ounce. When this is dry, you can remove the film after having lifted the edges with the point of a penknife. If you send the collodiodized plate to a plate maker, he will, doubtless, coat them with emulsion for you.

CARBON.—1. We do not think that tissue containing an extra proportion of pigment is in the market. You will find full directions for making carbon tissue on page 453 of the present volume, and perhaps the following proportions (about three times the usual quantity of pigment) will suit you.

Nelson's transparent sheet gelatine ...	20 ounces
Loaf sugar	8 ,,
Water	50 ,,

Melt in a water bath, and stir in an ounce and a half of the moist and ground Paris black, sold in tubes for water-colour painting. 2. All the qualities of gelatine required for the purpose can be obtained from Messrs. Nelson Dale and Co., of Dowgate Hill, City.

J. H. R.—The course generally recommended is to try to work the poison out of the system by attention to the general health, and the use of Turkish baths.

MEADOW.—It will give us much pleasure to insert your letter if you will allow us to put your own name to it. Surely you cannot expect us to insert your long tirade against the picture. Do you think that your opinions will suffer by being printed over your name, or that your name will be injured by being associated with your criticisms? May we print the letter over your name?

ENQUIRER.—In such a case it is difficult to give exact quantities, as so much depends on the nature of the paper.

A. ELBERT.—Comprehensive articles on the subject appeared in our volume for 1881, p. 54, 511, and 595. See also our forthcoming YEAR-BOOK.

A. H. B.—The information is curious, and we shall make use of it.

W. E. G.—1. See the series of articles, of which one appeared last week. 2. Not so; it is obtained by writing with an opaque ink on the negative. 3. It is the best, and several manufacturers of plates use it. The "substratum" consists of an extremely slight deposit of silica, formed by the action of the atmosphere on the alkaline silicate.

JOHN GILPIN.—We imagine that you will have to make them yourself, or get them made to your own designs by one of the Birmingham houses.

H. HOWARD.—It seems to us that the mischief arises from the mount; but to test the matter conclusively, cut a print into two parts, mount one portion on the questionable mount, and the other on a mount such as you have previously used. If both are kept under similar conditions, you will probably obtain positive evidence.

B. BOOTHROYD.—Unfortunately, we do not know the address of the gentleman, but we will try to get it.

TONING BATH.—We should recommend you to make up a fresh bath, as the loss of time and uncertainty involved in trying experiments would more than balance any gain. The fact of such an accident not being likely to occur again is an additional reason for wasting no time with it.

ROBERT SIMPSON.—1. It can be done, but involves much work and care. Call on Mr. A. L. Henderson, of King William Street, London Bridge. Why do you enclose stamps? It puts us to the trouble of returning them, and, moreover, we fancy you give an insufficient address.

W. S. F.—It closed last week.

T. HANSON.—There is no book on the subject, but articles frequently appear in the PHOTOGRAPHIC NEWS. See page 628 of our present volume, also 2 of the last volume, 1883.

J. THOMPSON.—The book is not to be had, unless by chance from a second-hand bookseller. You will find that the "Silver Printing" of Robinson and Abney, and the "Instruction" of Abney; will give you later and more useful information than the work you mention.

VANDYKE.—It would not be kind of us to give you the addresses of photographers who use the electric light, as we know that much of their time is taken up by visitors who want to see everything. To set up a good lighting plant of dynamo and engine would certainly not cost less than three hundred pounds; and unless you yourself possess some engineering skill, you may reckon something considerable for current expenses. If, on the other hand, you prefer to have a battery arrangement, you cannot do better than use Mr. Jarman's arrangement of bichromate batteries described on page 500 of our volume for 1881. This will give a light equal to about a thousand candles, and lasting quite long enough to make a portrait, the cost of the apparatus being about the sum you name. Write to Mr. Jarman; his address is Macintosh Lane, Homerton, E.

B. C. J. SEYMOUR.—The original is a zinc plate, which is etched by the usual chemigraphic process, and that which you have seen is doubtless an electrotype reproduction.

'The Whittaker of the Photographer.'—*Chemical News*

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1369.—*November* 28, 1884.

CONTENTS.

STANDARD SIZES FOR PLATES.

THE Berlin Society of Makers and Dealers in Photographic Goods has (in a fashion which somewhat reminds one of the three celebrated tailors who, according to a well-known legend, resided very near the site of London Bridge Station) determined what are to be the future standards of size for photographic plates and carriers—at any rate in the German Empire—and the new standards seem in some hasty fashion to have obtained recognition by the Photographic Society of Berlin, as the standard sizes of the future.

The new arrangement—if, indeed, the hasty and haphazard selection of sizes by the apparatus makers of Berlin can be called an arrangement—appears to have been made entirely without reference to the dimensions of the photographs usually demanded, or to the original size of the paper used for making the prints, and ordains that the sizes of the future shall be as follows, the measurements being in centimetres:—9 by 12, 12 by 16, 13 by 18, 13 by 21, 18 by 24, 24 by 30, 30 by 40, 40 by 30, 50 by 60. Manufacturers and dealers are to try and influence their customers to select apparatus made to the new standard, and to consent to old ones being altered when repairs are made; but until the good time of absolute agreement comes, manufacturers of plates will be allowed to make the following sizes under protest—centimetres:—10 by 13, 16 by 21, 21 by 27, 26 by 31, 29 by 34, 34 by 39, 39 by 47.

The *Wochenblatt*, in its character as the official organ of the Berlin Photographic Society, gives publicity to the new arrangement; but Dr. Stolze is evidently in doubt whether the standard measurements refer to the carriers or to the plates, and to his article he appends a note saying that he assumes the dimensions to refer to the plates.

The new standards of size translate very badly into inches, and not one of them comes very near to any size commonly used in England. Indeed, it is difficult to see the practicability of establishing standard sizes which shall be at the same time equally convenient to those reckoning by centimetres and those who use inches; but considering that the greater number of civilised nations measure altogether according to the metrical system, while Germany herself is in a kind of halting position between inches and centimetres, it would have been much better for Berlin to have waited for the International Congress on Photographic Constants, which is to meet in Brussels next spring. On this occasion, not only the sizes of plates will have to be considered, but, what is also of much importance, the difference in size to be allowed between the carrier and the plate.

If the Brussels Conference succeeds in establishing universal sizes, the following circumstances will, among others, have to be brought into consideration; and to do this thoroughly will involve a good deal of enquiry and labour.

1. The sizes of finished pictures most in demand and more especially suited for given purposes.
2. The dimensions of the sheets of paper ordinarily used for photographic purposes.
3. The sizes in which glass is usually sent out from the works.
4. Plates and apparatus now commonly in use.

Having determined on convenient sizes—and, if practicable, sizes already in general use—the dimensions can be given according to any system which may be convenient for the manufacturer or the user.

The present variety of sizes is extremely inconvenient for those who are in a foreign country, and it is much to be hoped that the coming Congress will establish standard sizes which will be universally accepted.

CONFERENCES ON THE PICTURESQUE.

THE Edinburgh Photographic Society is fortunate in its new President. Ever since the formation of the first Photographic Society, of which Sir Charles Eastlake, President of the Royal Academy, was the original President, great artists — both painters and sculptors — have taken but a languid interest in the Art Science, abusing it sometimes, using it often; but Mr. Norman Macbeth, R.S.A., is distinguished as the one painter of eminence who has always believed in photography, and has done all in his power to make the followers of our art into artists. He has actually believed that it was possible to make pictures by aid of photography; he has known and taught that it is the man, and not the material, that makes the picture. For many years Mr. Macbeth has represented the pictorial side of photography in the Edinburgh Society, and whenever this genial gentleman discourses on art, his advice is direct and practical, while his hearers feel that they can go and apply it in practice in their every-day work.

In his admirable address, lately delivered to the Edinburgh Society, the President announced that every alternate monthly meeting would be set apart for a friendly conference on the works of those members disposed to submit them for that purpose. "But," continues the President, "as knowledge is what we aim at, I do not see that we should confine ourselves solely to our own productions. Anyone in possession of a photograph which he admires, should bring it to the meeting for inspection and consideration, if not for discussion; but in every case it should be distinctly labelled whether for discussion or not, always reserving the name of the author. We cannot look for examples for discussion from professional men unless they are pleased to be generous enough; but from amateurs, who have no object but the acquisition of knowledge and experience, I would fain hope there will be no lack."

The mechanical and chemical sides of the art have,

during the last half-dozen years, progressed with giant strides. Processes almost unhoped-for have become established facts, giving the operator opportunities for producing results of which he had not previously ever dreamt. One year we were boiling our developers in the almost forlorn hope of making a slightly shorter exposure sufficient with the wet process, and the next we were in possession of a method of working, of which it might almost be said that it leaves the photographer to think of nothing else but the art qualities of his work, and enables him to secure his results with the utmost rapidity and certainty. But has the photographer—the picture maker—taken all the advantage he should have done of his new opportunities? We think not. Art knowledge has, of course, spread among photographers, but has it been used in anything like proportion to the improvement in processes?

Pictures on the whole are probably better than they were in the days of collodion, but that is to a great extent owing to the shorter exposure necessary. It is disappointing, with all the facilities the photographer now enjoys, not to see some really great works in our exhibitions. Too many photographers try to run before they can walk, and neglect to study the few simple rules upon which all art is based; rules which have been observed from the time when representation emerged from the mere tracing of form and became art. These "Conferences on the Picturesque" ought—if they are conducted properly, as they no doubt will be under the presidency of Mr. Macbeth—to be of immense value in diffusing a knowledge of art among the members of the Edinburgh Society. There is just one thing against which those who send in pictures must guard themselves: they must not be afraid of a little friendly criticism, and must learn to listen to the most adverse opinions with equanimity. Given plenty of pictures to criticise and good temper in the criticised, and these conferences should be not only profitable, but delightful.

We hear that a number of contributions have been sent in, not only from amateurs, but from professional photographers, for the first conference which takes place next Wednesday.

We wish it every success, and recommend the idea to the consideration of other societies.

"THE OLD INN YARD" BY D. BARNETT.

AMONG those pictures which received no official recognition at the Pall Mall Exhibition, may be mentioned that which forms our supplement this week: No. 351, "The Old Inn Yard," by Mr. Barnett.

Poets and painters have long delighted to place upon record the charms of old country inns, where none of the pomps and vanities of the modern hotel are to be found, and where one feels, as it were, at home in a new home almost immediately on entering. Now and then one comes across a photograph of the old-fashioned and quaint hostelrie, but too often is all pictorial effect lost, either from the fact of the camera being set "square on" to the building, or by some prominent indication of progress of the last few years being made a prominent feature in the composition—let us suppose a tricycle or an iron milestone.

It is in the following words that the author of our picture laments the gradual disappearance of certain phases of the picturesque before modern civilisation, and tells us about the production of his "Old Inn Yard."

"It is a melancholy fact that as the knowledge and love of art is becoming more widely spread, so is the search for the picturesque becoming more and more a difficult task. To the painters, perhaps, the obstacles are not so great, but to the photographers they are often insuperable, and it is greatly to be deplored that some of the appliances of modern science cannot be made to assume less objectionable forms. What can be more out of place, amidst the wildest and most romantic scenery of Norway, than the ugly Telegraph post and wires which are constantly obtruding themselves, and which are of course always present when least wanted? Railway cuttings, mining operations, reservoirs, disfigure the most beautiful spots, and the dear old relics of past generations are fast disappearing.

"It was after a long day's tramp with my camera, in the neighbourhood of Stroud, that I came upon the 'Old Inn' at Nailsworth. It was rather an awkward spot for operations, being situated in the main thoroughfare; but the effect of shadow was so strikingly beautiful that I hastened to make the attempt. Of course the usual stuccoed atrocities were present in close proximity, but fortunately for me they were so situated that I was able to avoid them. So I exposed the plates, and right glad was I that I had lost no time, for the effect vanished almost as soon as I had finished."

THE SIEMENS STANDARD LIGHT.

AT the last ordinary meeting of the Photographic Society Captain Abney called attention to the Siemens or Hefner-Atteneck standard light, and the following details, received from a German correspondent, will be of interest. The light, as our readers know, is obtained by burning amyl acetate in an open burner, the diameter of thus being $\frac{5}{16}$ of an inch, and the height of the flame, after ten minutes' burning, 2·6 inches.

Experiments were made with various other substances in the same lamp, and the results obtained are given in the following table:—

	Light.	Seconds required to burn 1 gram.
Amyl valerate ...	1·03 ...	436
Amyl acetate (pure) ...	1·00 ...	388
Amyl acetate (com.) ...	1·00 ...	388
Amyl formiate ...	1·01 ...	372
Isobuttl acetate ...	·99 ...	373
Isobuttl formiate ...	·97 ...	355
Ethyl acetate ...	1·24 ...	212

It may be remarked that amyl acetate boils at 138·6, and is not explosive.

The employment of commercial instead of pure amyl acetate, the replacement of a hard spun wick by a soft one, and the mode of trimming the wick, do not appear to materially affect the luminosity of the flame. As the introduction of the new light should present no difficulty or uncertainty, it ought to prove useful for sensitometric work.

PRINTING BY DEVELOPMENT.

UP to the present, albumenized paper has tolerably well held its own as a material upon which to print photographs, and notwithstanding the fact that good development methods have been proposed and have been practised by a few, they have failed to come into general use for every-day work. Perhaps one reason for this is the circumstance that it has been difficult to imitate the style and get-up of an ordinary albumen print, and both photographer and customer are slow to adopt anything which differs in appearance from that to which they have been accustomed.

Quite recently, however, Messrs. Marion and Co. have introduced a printing paper which requires only an exposure of from two to four seconds on a dull winter day, and which yields prints having all the general qualities of those made on albumenized paper—with this exception, however, that the surface is a little better, if anything. The paper is obviously coated with a gelatine emulsion, and we fancy it also contains albumen, but of this we are not sure. As regards the sensitive silver compound, there is scarcely any doubt that it is a mixture of chloride and bromide, possibly with some additions.

MEISENBACH CO., LONDON.

C. BARNETT, CHELTENHAM, COPYRIGHT.

"THE OLD INN YARD."

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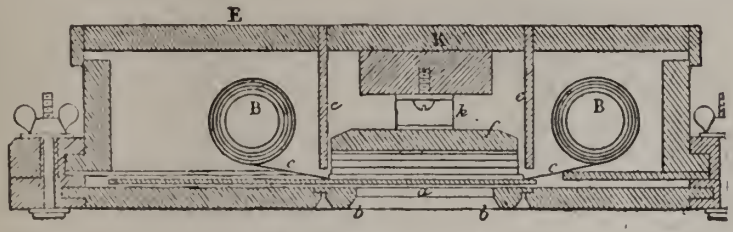
The exposure can be made in an ordinary printing-frame, but, considering the shortness of the required exposure, those who have to make many copies will doubtless prefer to use a quick printing-frame of the Fontayne type, one of the simplest of these being that designed by Tromel, many of the complex adjustments of the original Fontayne frame being suppressed.



TROMEL'S PRINTING FRAME.

deseribe the mode of working with the new paper, especially as the "*Leading Journal*" has for a long time contented itself with dishing up the stalest and most unauthentie of photographic information to its readers, and it is only within the last twelve months or so that it has properly represented to its readers the current progress which has been made in photographic matters: and the artiele in which the process of printing by development is deseribed is so elearly written as to be intelligible to the general public, and so full and exaet as to be of value to the photographer. The *Times* in its issue of last Monday says:—

"The idea of coating paper with a gelatino-bromide of silver followed obviously enough on the suecessful employment of the same compound for the produetion of negatives, and many attempts have been made to produce in this mauner a paper which might give results equal to those of the process which is always known as silver printing, and at the same time be so sensitive to light as to allow the image to be impressed on it in a few seconds, instead of requiring an exposure often of hours; but the ehief objection to a gelatino-bromide paper is its cold gray, or even greenish, tone, and this appears the principal reason why pietures on it have not secured the favour of a publie edueated to a liking for the rich purple and ehocolate hues of ordinary photographs. The enlargements are generally a good deal worked up by hand, and when carefully finished form no bad imitation of a crayon drawing. The difficulty of proeuring warmth of tone and eonsequent brilliancy in the picture seems now to have been overeome in a new material which Messrs. Marion, the photographic dealers of Soho Square, have produced and are about to supply commercially. Messrs. Marion propose to work the process in sceret, believing that a safer method of proceeding than patenting it; and, consequently, the invention is of less interest to the scientific photographer than it would be if the manner of production as well as the results were revealed; but probably the effect on the photographic industry will be much the same. The paper is obviously coated with a gelatine emulsion of some sort, and in all probability rival experiments will before long find out its precise nature. As regards the results producible by its means, their value does not seem to admit of much doubt. No industrial process can properly be termed successful till it has stood the test of regular commercial work; but it is at all events safe to say that no improvement of such promise has been introduced into photography since the advent of gelatine plates. In Messrs. Marion's studio, on Saturday last, the writer saw produced three prints, which nobody could tell were not ordinary prints, produced with exposures of two, three, and four seconds, and he afterwards, at home, at 4 o'clock in the afternoon, with an exposure of fifteen seconds, produced on a first trial almost equally good results.

"The process of working the paper is quite simple. As may be supposed, the image has to be 'developed'—that is, no visible image is produced by the exposure to light. Consequently, the exposure has to be estimated, as it has in taking a portrait or a view. The development is effected in very much the same way as if an ordinary gelatine plate were under treatment, the developer being a weak solution of ferrous oxalate. After development the image is of a rich purple; but as this would change in the final, or 'fixing' bath, it is necessary to 'tone' the picture, as is done with an ordinary silver print, in a solution containing gold. After this the picture is 'fixed' in the usual manner. Considerable variety of tone can be produced, the tints ranging from a warm red brown to a purple, or even black.

"The objections to the process are that it requires rather more skill than the old system. It has to be carried out in greater darkness and with greater precaution. Nor are the results quite so bright and good as the best silver printing. It would, however, require an expert to tell the difference, and certainly no purchaser would be likely to complain if he were supplied with a batch of prints on the new paper. As regards permanence, only time can answer that question; but there seems no reason why it should be less permanent than the old, which, unfortunately, has in this particular not much to boast of. The new paper will, in all probability, come largely into use for winter work, and it ought to be used by all portrait photographers for sending out 'proofs' at once of their portraits."

The developer for Marion's paper is merely an ordinary oxalate developer, and the picture comes out quickly, and possesses a rich purple tone; but as this would more or less completely disappear in toning, it is necessary to use a gold bath, as in the case of ordinary albumenized prints. The fixing is effected in the usual hyposulphite bath.

It pleases us to note that the *Times* was the first to

Let us now quote from a leading article which appeared in the PHOTOGRAPHIC NEWS on January 5th, 1883:—

"We have frequently referred to the circumstance that gelatino-bromide or gelatino-chloride paper is likely to attain a position of some commercial importance, more especially when it may be necessary to produce a considerable number of prints in a short time; but very few photographers have yet learned to appreciate the power placed in their hands by the introduction of paper coated with gelatine emulsion.

"Some of our readers will remember that in 1860 (vol. iv. p. 270) we described a rapid photographic printing machine, which was invented by Mr. Chas. Fontayne, of Cincinatti. A strip of paper is drawn under the negative, pressed into close contact with it, and a measured exposure is given; solar light concentrated by a condenser being used. The series of operations is repeated, so that a number of impressions may be taken on the same strip of paper, it being merely necessary to turn a handle until the strip or roll of paper is exhausted. Although Fontayne used the most sensitive calotype paper obtainable when his machine was constructed, he did not find it possible to obtain more than 200 impressions per minute from one negative. This corresponds with a rate of 12,000 per hour, and by passing the exposed band directly into the developing, fixing, and washing troughs, the subsequent operations might be made to keep pace with the exposures.

"By reproducing the negative a sufficient number of times the turn-out of a machine constructed on the lines laid down by Fontayne might be increased indefinitely; and as a simple gas flame would serve in the case of bromide paper, we may before long hear of the steam photographic machines working all night, side by side with the steam typographic machines, for newspaper work.

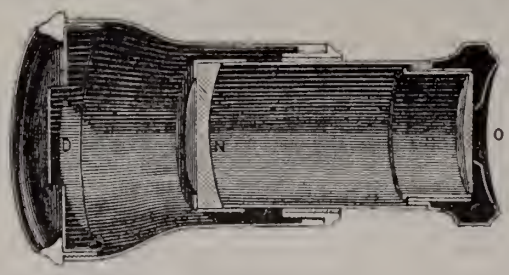
"Fontayne proposed to work his machine by steam, and the description given in the NEWS twenty-three years ago is so detailed and circumstantial that there seem to be very few novel points which the modern patent-hunter can add and lay claim to. We hope to hear of the actual use of Fontayne's machine during the present year.

"Ordinary photographic papers—such as Saxe or Rives—are, we believe, manufactured in widths of fifty-four inches, so that many negatives of ordinary dimensions might be printed from simultaneously."

ROSSIGNOLS' ICONOMETER, OR VIEW-METER.

AN apparatus likely to be of considerable use to workers in the field, is the iconometer of M. Rossignol, and we take the following description from a recent number of *La Nature*. In principle, as also in construction, the present form of Rossignols' iconometer does not differ very much from instruments which have been described in the PHOTOGRAPHIC NEWS; but notwithstanding this, the instrument now designed is so simple, convenient, and portable, as to well merit a detailed description at this time. Another point in its favour is the ease with which it may be constructed by any person having a moderate amount of skill in the use of tools. But we may assume that the amateur mechanician would often fail to give his apparatus the elegant form of the iconometer as represented below; unless, indeed, a discarded opera-glass be taken as the basis of its construction.

Rosignols' iconometer has the external form of a single opera-glass, but the arrangement of the lenses is reversed, O being a convex lens, and N a concave lens; this arrange-



ment serving to present a diminished image of the landscape to the eye of the observer.

In order that the landscape, as seen through the iconometer, may correspond to that included on the sensitive plate, a metal screen having a rectangular aperture of suitable proportions is fixed at the large end of the instrument, D; and by sliding the lens-carrying portion in or out, a position can be found corresponding to each lens carried. These positions must be determined and marked by the user on the tube of the instrument.

NOTES FROM NEW YORK.

INTERESTING MEETING OF THE AMATEUR SOCIETY—THE PLATINOTYPE PROCESS — AN IMPROVED DEVELOPING TRAY—A NEW DEVELOPER—PROPOSED EXCHANGE OF LANTERN SLIDES.

THE technical meeting of the Society of Amateur Photographers, held at their rooms, 1260, Broadway, on the 11th inst., was the most successful and entertaining of any held this fall.

Mr. Chas. A. Needham made a demonstration on the platinotype process, and explained very fully all the details necessary to properly work it. Several sheets were sensitized before the audience, special arrangements having been provided for that purpose; and before the close of the meeting, small samples were distributed among the members to take home for trial. Several prints previously made from some of Seavey's negatives were developed with a hot oxalate of potash solution, with such rapidity and perfectness as to excite the admiration of the audience, who greeted the success of the process with applause. Mr. Needham exhibited and described specimens of the latest boxes and apparatus required to preserve and work the paper.

Questions were asked concerning the permanency of the prints, one gentleman remarking that in some parts of Germany it was held that the prints turned yellow and faded.

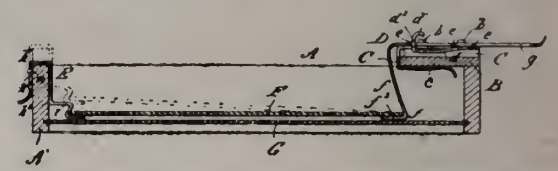
Mr. Needham, in reply, thought such effects must be due to some irregularity in preparing or working the paper, and believed if it was washed in the acid baths for the allotted time, as specified in the directions, the picture was as permanent as anything could be. With much artistic taste he had arranged a fine series of specimen prints, and enlargements upon one side of the room, most of which had been furnished by Mr. Willis and Mr. Wood, of Philadelphia, for the occasion. The exhibit included photographs on napkins and other linen articles, and also specimens of the new sepia tone, which were admired.

After passing a vote of thanks to Mr. Needham, a Hare camera and changing-box containing all the latest improvements were shown, one of its distinguishing points being the great length or draw of the bellows. Its fine finishing was much admired.

Mr. R. A. C. Smith, a member, and owner of the camera, explained its merits, and successfully operated the changing-box. I understand other members of the Society have sent abroad for duplicates, which would go to show that there is still a field in this market for English work.

Dr. John H. Janeway submitted a "Table of the Solubility of Chemicals in Water," which he had specially compiled for the amateur's use, and distributed printed copies among the members. A vote of thanks was passed to him for the work.*

Mr. Beach exhibited an improved developing tray, patented by Samuel B. Pratt, of Boston, Mass., October 17th, 1884, and sent by Mr. Chas. Parker, of Newark, N.J. It resembles in form the tray sold by Marion and Co., and is a wood frame provided with a glass bottom, having a pocket at one end, arranged to hold the developer when turned in a vertical position. Two adjustable brass spring feet press against the glass bottom inside, between which is held the sensitive plate. One foot is adjustable vertically, so that it may be raised up from the glass bottom half an inch. The other foot, which always lays against the glass, is adjustable horizontally, and permits different



sized plates to be held for development. A special spring-catch is provided in the sliding part of the foot, which holds it in any desired position. The model shown was adapted for three different sized plates. The advantages were, that the vertical adjustable foot enabled the operator to raise one end of the plate out of the solution, so that it might be removed without soiling the fingers.

A special method of packing the rubber joint between the glass bottom and wood frame had been adopted, which prevented leakage, a fault which trays of this class are said to possess.

Mr. C. W. Dean read an interesting paper on "The Relative Rapidity of Lenses and the Use of Stops." His labour was greatly appreciated, and the system of making stops which he advocated was voted to be adopted by all members of the Society. A special committee on lenses was appointed to experiment further on the subject.

Mr. Newton explained a new pyro developer, which he and a few of his friends had tried, and obtained results superior to the ordinary carbonate of soda developer. The strength advised for use in the development of a drop shutter-exposed plate was as follows:—

No. 1—Water	1 ounce
Carbonate of soda (granulated)	15 grains
Yellow prussiate potash ...	15 ,,
Sulphite soda...	5 ,,

* We shall publish this next week.

No. 2—Water	...	...	...	1 ounce
Chloride of ammonium			...	7 grains
Pyro (dry)	...	...	...	6 ,,

Nos. 1 and 2 are then mixed, and the whole flowed over the plate. The image appears rapidly, and the shadows remain clear, giving a negative, when fixed, of a steel-blue or black colour. Usually no bromide is required except for excessive over-exposure: in that case, half a grain of bromide of sodium to the ounce of developer is advised.

A new function of the bromide was discovered by Mr. Newton in connection with this developer which may prove of value. He stated that it was well known, when gelatine plates had been kept for any great length of time, the silver in the film became reduced where it was in contact with the cardboard separating frame, thereby injuring the plate to such an extent as to render the marking of the frame distinctly visible after development. By experiments which he had tried, he had ascertained that the addition of a small quantity of bromide of sodium to developer would prevent the showing of the separating mat marks and produce a clean clear negative. He therefore advised those who had plates which showed the reduction of silver at the edges, while using the ordinary developer, to use bromide of sodium with the improved developer.

The theory of the developer was that when Nos. 1 and 2 were mixed, free ammonia was liberated, which, in uniting with the yellow prussiate of potash, formed an extremely powerful developer; while the chlorine, uniting with the soda, formed chloride of sodium, which acted as a restrainer, and by its bleaching action tended to keep the shadows clear.

He showed several specimen negatives which illustrated the power of the developer in bringing out details on instantaneous exposures, where with the developer recommended by the manufacturer of the plate, only one-half to two-thirds of same details could be obtained.

Mr. W. E. Partridge had tried the same formula with much success, and showed two negatives.

Mr. Beach also showed two negatives which had had very short exposures, one of which was developed with dry pyro as recommended, the other with his sulphurous acid and sulphite solution of pyro added to No. 2 in place of the dry pyro. He found that the dry pyro developed plate was intense, and when fixed showed a greenish-yellow colour in the shadows.

Mr. Newton thought it was over-developed or exposed too long.

Mr. Beach stated that the developer mixed according to the formula was very clear, and had a light straw colour by daylight, which turned to a dark red after development. The development was rapid, clear, and vigorous; it seemed to him all that Mr. Newton claimed for it. The smell of liberated ammonia was very perceptible. The second plate, which had the same exposure, developed with the acid solution, bore a marked contrast to the first; the development was slower and more gradual, and when finished and fixed the negatives had a wet plate gray appearance, clear in the shadows, and less dense than No. 1. There appeared to be as much detail brought out as in No. 1, and the negative was perfectly free from the green yellow colour before noticed. Mr. Beach showed a sample of the developer after it had been kept for twelve hours; it was sherry red in colour, but quite clear. His opinion was that the sulphurous acid solution of pyro added to the developer improved it.

Mr. Newton stated that stock solutions of No. 1 and No. 2 could be made up to suit different tastes. Regarding the mode of procedure in the case of excessive under-exposure, he advised the mixing of equal quantities of No. 1 and 2 without the pyro, and the addition of a little at a time to the mixed developer, thereby forcing the development by degrees, until the details were brought out. He was also of the opinion that the pyro could be kept mixed in solution with No. 2, but intended to make further experiments in regard to it.

The subject of an exchange of lantern slides with other amateur societies was discussed, and a committee appointed to perfect details. Why could not an international annual exchange of slides be started? The expense would be light and the interest unending.

November 15th, 1884. THE NEW YORK AMATEUR.

HINTS ON POSING AND THE MANAGEMENT OF THE SITTER.

BY H. P. ROBINSON.

CHAPTER VII.—OUTDOOR GROUPS.

WHEN a group is to consist of more than three or four individuals, it is often convenient to take it out of doors. There are several advantages in getting out of the studio: you are not cramped for room, and need not pile your sitters together, as you are often compelled to do in the small space available in most studios. The exposure will be much quicker, taking not more than one or two seconds with a rapid rectilinear lens, and smaller diaphragm may be used than would be possible in the studio; the greater depth of focus thus gained allowing much wider freedom in the artistic arrangement of the group.

An outdoor group too often represents a mass of figures placed one over the other on a bank, with perhaps a brick wall for a background, without any attempt at artistic arrangement, like the sketch, which is copied from a photo-

graph, or a row of figures set up to be photographed, without any consideration as to their arrangement except to get them in focus. This latter disposition is sometimes caused by the impossibility of getting any help from the formation of the ground or place when the photograph has to be taken, for it nearly always happens that the large groups are taken "at home," and the photographer must do the best with the materials he can find. He should look out for and take advantage of any spot that would aid him in breaking up his group and giving variety to the general forms; if he should find a picturesque set of steps, he may consider himself fortunate; even one or two steps are better than nothing. In selecting his background he should endeavour to secure one with a broad expanse of light, such as a light wall, if not too blank. Much detail is objectionable, as it interferes with the figures. The worst background, but the one that is oftenest used for groups, consists of foliage, especially when laurel or any shrubs with large shining leaves have place. The white spots produced by the glittering foliage, especially when out of focus, is very disagreeable.

I give an illustration in which a flight of steps leading up to the door of an old Gothic house has greatly aided the photographer in arranging a portrait group.

When you have to arrange a group, you should begin by finding out the most important persons in the company, so that you may assign them conspicuous places. In a short time you will be able to discover "the funny man." There is always one in every group, who thinks it a rare joke to make some of the others laugh and spoil the negative. More groups are spoilt by this idiot than by any other cause. Everything must give way to his wit, and it takes a spacious magnanimity to endure his buffoonery. You must neutralise him, or you will do no good. If you have courage enough, go boldly up to him, and say something to this effect:—"So you are the funny man, are you? If I can get on with you, I can easily manage all the rest. If you will kindly suppress yourself for a few minutes, and let me have my turn, I shall be much obliged." He takes this usually in one of two ways—either he is a good fellow who sees a brother joker in you, and does all he can to help you; or he sulks. Either way will suit your purpose. In the illustration you will easily see the suppressed funny man in the one set against the wall, where he makes a capital balance to the principal group, and looks, in the original photograph, as if he had not quite made up his mind whether he ought to be ashamed of himself or not.

By this time you have got to some knowledge of the different members of the group, and have settled in your mind, apparently, how they are to be arranged. When you have quite made up your mind, and not till then, and when the camera is quite ready, place your figures. Don't make experiments or changes if you can help it; in other words, don't look like a muff, but let the members of the group see that you know what you are about, and mean to carry out the arrangement that you have mentally formed.

I have seen operators make an ostentatious display of the trouble they were taking, as if they were expected to earn their money by the sweat of their brow, making numerous changes until they wearied out their victims. People are quite up to this sort of display now, and laugh at it—until it becomes too serious.

In a well-designed group the principal rules of art will be observed, especially variety, balance, contrast, and breadth. Every line and form will be so arranged that a series of pyramids, intersecting and mingled with each other, are created. In the illustration, those to whom it was thought advisable to give most prominence are in the centre, and form a pyramidal group to themselves, but they become part of a series of pyramids, all blended into one, of which the top of the arch of the door is the apex. It may also be noticed of what extreme value a bit of pure black or white becomes when in the right place. In the photograph—it is not so easy to show it in the small cut—the white hat of the standing figure to the right absolutely redeems the group from failure. Imagine it away, and there is no artistic solidity in the group. This one small spot of white in the right place keeps everything together.

In the second group the place was different, and there

was not so good an opportunity of forming a fine group. The ground was flat, and there was no natural means of raising any of the figures above the others; the photographer had therefore to be content to break the line by seating some of his figures, and making others bend, as though talking to them. By this means he succeeded in forming a series of varied pyramidal forms, running into and connected with each other, so that the general effect should not be scattered. There should always be a "oneness" in a group; the string should run through all the beads, but should be more felt than seen.

There is another vast difference between the two groups: the first has for its surroundings a corner of a very fine Tudor Hall, partly overgrown with old English shrubs; the second is a sham Gothic battlemented verandah, protecting a large French window—an incongruous mixture—and the foreground consists of the geraniums, calceolarias, violas, and other kindred plants of an Italian garden.

There are some disadvantages about taking groups and portraits generally out of doors, the chief of which is the difficulty with the expressions from the excess of light. Some people are more affected by this than others; these should be carefully looked after, and so arranged that the light should be of the least annoyance to them. A por-

trait group should never be taken in sunlight if there is any possibility of avoiding it.

It sometimes happens that you have to get some other hand to expose. If you have to depend on a quite inexperienced person, it is as well to explain to him that the cap must be removed from *before* the lens as well as off it. I have sometimes seen the cap taken off and held in front of the lens. There is a certain butler who exposes a group in which the photographer annually appears, who talks learnedly of seconds and fractions of seconds, and firmly believes that he takes the photographs.

ISOCHROMATIC PLATES.

BY W. GOODWIN.*

You all know what a spectrum is, and have all seen it in the rainbow, or in a more homely form as thrown upon the wall by the prisms of a chandelier. When we examine such a spectrum, we find it to consist of a band of coloured light, graduating from red at one end, through orange, yellow, green, blue, and indigo, to violet at the other; these colours blended together, form the white light by which we take our photographs.

Now, if we expose a plate to this spectrum, and develop it, we find that only some of the colours have effected reduction of the sensitive salt.

It is evident that most of the work is done by the rays toward the violet end of the spectrum (a great deal is done by rays beyond that which are invisible to the eye), and that green has comparatively little effect. We can thus see why in landscape work we lose so much of the detail in shadows and foliage, the light which presents such detail to the eye being rich in green and red, but deficient in blue and violet. Could we obtain plates sensitive to green, we should get negatives giving a much more natural gradation.

Leaving out of the question the actual reproduction of colour, which is as yet a far-off possibility, let us see what can be done to secure in light and shade a better rendering of the value of colour. The meaning of this term value is, that light colours should give light tones, and dark colours deep tones. We know that if we photograph blue and red on an ordinary plate, they show in the print as white and black respectively, while yellow and green both appear dark; but if we can make plates sensitive to the so-called non-actinic colours, we will then obtain prints showing a more natural gradation.

The method used to obtain such plates is the addition of some substance to the film capable of absorbing and converting into chemical energy those rays which are inactive on an ordinary plate. These substances are dyes, mostly of the aniline series, and a few natural vegetable colouring matters. They are themselves sensitive to light, as manifested by a bleaching action under its influence. The rays which effect this bleaching are those towards the red end of the spectrum—that is, the very rays which we wish to capture and divert to our plate. The immediate cause of the bleaching is oxidation of the dye, but how this affects the silver salt is a matter of dispute.

Abney holds that the dye, in absorbing oxygen, acts as a developer, similarly to pyrogallic acid in the alkaline developer, this slight reduction serving as a nucleus for a further deposit of silver during development of the plate. This theory seems to be borne out by the fact that the dye is only a colour sensitizer in presence of a chemical sensitizer; that is, a body capable of absorbing the bromine, &c., set free during exposure. Gelatine is such a sensitizer; also silver nitrate in the case of collodion plates.

Vogel's theory is that the energy absorbed in bleaching the dye is transmitted to the silver haloid, upsetting its equilibrium, and rendering it capable of development. This theory seems to be proved by the fact that a dyed collodion film exposed to the spectrum will, if coated with collodio-bromide emulsion, and developed without further exposure, give an image of those parts of the spectrum to which the dye is sensitive. It is very evident, however, that the invisible photographic image is still in want of a satisfactory explanation.

A large number of dyes have been found more or less effective, and I might give you a long list bearing the delightfully simple and explicit names peculiar to the aniline and kindred series; but it will be sufficient to mention those which have been put to practical use. Amongst vegetable colouring matters chlorophyll extracted from green leaves, is a sensitizer for red, and turmeric extract for red, yellow, and green.

Most of the dyes which have been tried have slowed the plates, and have been most effectual on collodio-bromide; but Vogel has recently discovered a new substance which is most effective with gelatino-bromide, and which actually increases the sensitiveness of the plate. It is, however, such a recent discovery that I can learn little about it; he has named it azaline.

Next to azaline, eosine seems to be most useful, and plates prepared with it are now prepared commercially. Vogel has by means of eosine prepared collodion plates eight times as sensitive to yellow as to blue; but with gelatine his results have been less satisfactory, the plates being only twice as sensitive to yellow as to blue. This is a long way short of what is required, for in nature, yellow is about twenty times as luminous as blue to the eye, therefore in using these plates for copying oil-paintings it is found necessary to photograph them through yellow glass to restrain the excessive action of the more actinic colours. The above results are obtained on bromide plates, which are most affected by these colour-sensitizers; many substances which have a marked effect on bromide are inactive on chloride and iodide.

We are likely to hear a good deal about eosine, and it may interest you to know a little about what it is. Though commonly known as an alkaline dye, it is not really so, but is a potassium compound of fluorescin, which in its turn is derived from resorciu, a substance allied to pyrogallol, Pyrogallol, hydrokinone, and pyrocatechin, all yield bodies similar to fluorescin, and these produce dyes like eosine; therefore when we buy eosine it is rather doubtful what precise substance we get. This may explain why some experimenters have met with less success than others.

True eosine exists in two forms—iodeosine or blue shade, and bromeosine or yellow shade. It gives with silver nitrate a precipitate, soluble in ammonia, which is sensitive to light; a few drops of the ammonia solution added to an emulsion is found the most effective way of preparing the colour-sensitive plates. Ordinary plates, however, may be treated with a solution of three parts eosine in a hundred parts of water containiug ten per cent. of ammonia, and then dried. Here is such a plate, which you see is a faint rose-colour; here is a yellow plate stained with turmeric. I now pass round a colour-scale with negatives on two such plates, and on an ordinary plate. The latter shows the blue dense, and yellow almost clear glass; the turmeric plate shows the green denser, but on the eosine plate the difference is very striking; the yellow is nearly as dense as the blue, while both green and yellow show a notable gain in density.

It is not necessary to have a highly-coloured film—the merest trace is sufficient. Dr. Eder prepared a stained emulsion, from which he separated the bromide by means of Plener's centrifugal machine this he washed till the water came away colourless, and re-emulsified in fresh gelatine, and the resulting plates were as colour-sensitive as the original emulsion. The washed bromide was faiutly tinged, and Eder conjectures that an insoluble compound is formed between the bromide and the gelatine immediately surrounding the grains, which being stained is sufficient for the purpose in view.

* A communication to the Glasgow and West of England Photographic Association.

Notes.

It is probable that the time may come when a photographic studio will be considered an indispensable adjunct to every first-class picture gallery. What an opportunity was lost last January when the Sir Joshuas were gathered together in the Grosvenor Gallery! Next January an unprecedented collection of Gainsboroughs will be on view, but of course they will be allowed to depart un-photographed. A photographic studio will not always be an iron excrescence.

The photographic hat of Mr. Mendoza will suit those who may wish to take surreptitious photographs in a public building. A lens is fitted at the top of the hat, and may

be taken for a ventilator by the bystander. Inside the hat is the camera, with arrangements for focussing, changing the plate in exposing. With the apparatus Justice itself might be photographed on the Bench, unless the appearance of a person in a half-kneeling position, with his face buried in his hat, should excite the dynamite-hunting instincts of some of the guardians of the Court. To obtain clerical portraits with the hat-camera should certainly be very easy.

From America comes a suggestion to make bank notes on asbestos paper, and to use a vitrifiable ink for printing. Photographs upon asbestos paper have been made in this country, as we have already pointed out, but they generally have a coarse appearance.

The very un-English policy of the National Gallery authorities in granting facilities for the photographing of the master-pieces of their collection to a German firm, while they refuse to allow a London Fine Art Association to enjoy similar privleges, is to form the subject, it is said, of more questioning in Parliament, and surely with reason, for it seems to us that even on patriotic grounds English photographers had not been permitted to reproduce paintings in the great English Art Gallery, there should have been enough—well we will say, *camera-derie*, in the breasts of the Trafalgar Square officials to have induced them, if they granted favours at all, to make their own countrymen the recipients of them.

There exists—or, rather, is supposed to exist—a postal arrangement by which *bona-fide* trade samples can be sent at a low rate of postage from Great Britain to the various countries comprised in the postal union.

As far as transmission from Great Britain is concerned, the operation of the so-called pattern or sample post is so uncertain, and so liable are samples to be detained, that business people who have important samples to forward either prefer to pay letter postage for them, or to send them by private agencies.

We posted two small electrotypes of printing blocks, these electrotypes being properly prepaid, endorsed as samples, open for inspection, and quite valueless in themselves; they were, in fact, merely samples of a new process of photo-engraving. Instead of forwarding the samples, the postal authorities sent a letter to each of the addresses, asking for a remittance of three shillings and fourpence, on receipt of which they promised that the blocks should be forwarded as letters. If this were merely the result of a casual mistake, one would think but little of it; but it appears to be the outcome of a general order that all printing blocks are to be detained if posted as samples.

In reply to a letter of ours demanding that the blocks should be forwarded as addressed, they were returned to us with an unsigned and undated memorandum as follows:—"*These blocks are neither books nor samples.*"

A fresh demand on our part to have them forwarded was made, and they were forwarded; but a letter was sent to us requesting that before any more are posted, certain particulars should be sent to the postal authorities. In other words, before posting a sample package, you should advise the Post Office that it is coming, and give a full description; then it may, perhaps, be forwarded.

Now that photo-engraving methods are becoming of real commercial importance as substitutes for wood-engraving, many will desire to transmit block samples through the post, as to send a print is quite useless, the block or an electrotype reproduction being absolutely essential to enable a printer to estimate the real value of a process block.

According to the Postal Guide, two classes of articles are transmissible as patterns. First, "*Bona-fide trade patterns*," which we may suppose to include such articles as, a negative to show the quality of dry plates offered, any article to show the style in which an order can be executed, a stereotype or electrotype intended as a sample of work, or an example of a photo-engraving process. The second class comprises simply "*samples of merchandise*."

When the South London Society was established, it was intended that it should deal mainly with the art aspects of photography; but somehow or other this has not been the case, although one can hardly assert this without recalling to the reader the able discourse on art as applied to photography which Mr. Norman Macbeth delivered not long ago at a meeting of this Society. At the present moment, however, Edinburgh seems about to take the lead as the art society; indeed this is to be expected, for Mr. Macbeth is president. Our readers should turn to page 753, where they will find some remarks on the Art Conference which the Edinburgh Society will hold.

One of the lectures recently delivered by Sir W. Thompson at Philadelphia was on the wave theory of light. In this lecture billions are handled as though they were units. Sir William tells us that a wave of red light has 400 billion vibrations per second. When twice the speed is reached, violet light is perceptible; doubling this again, we get to the extreme end of the range of known light; while a fourth of the number of vibrations composing red light takes us at the opposite end of the scale to what is termed radiant heat. The longest wave yet found in the field of radiant heat was measured by Professor Langley, the number of vibrations being 30 billion per second. It is to be hoped that photographers will not get too much absorbed with these stupendous calculations, for although Sir William Thompson asserts that it is just as easy to conceive 400 billion as it is to conceive that twice two make four, everyone will not believe him. It would be very shocking if some rash photographer had his head turned in the effort of imagining what 800 billions of vibrations—violet light—are like!

A pretty little crop of troubles may be expected to

spring out of the forthcoming Beauty Show in Paris. Already fault has been found by the candidates with the judges, one gentleman in particular being objected to because it is rumoured he has a preference for pug noses. Then some of the ladies can't see why their photographs should be sold, and themselves get nothing out of the transaction, although it is obvious that without their assistance the photographs could neither exist nor be attractive. A third section are clamorously demanding that no advantage be given to wealthy competitors by appearing in silks and satins, and that, to make all equal, the costume shall be a white cotton dress, high up to the neck, with a holland pinafore. On the whole, it looks as if the promoters, before the Show is over, will wish they had never began it.

Of the many variations of photographic processes in use we are aware, but we have learned of the existence of yet another chemical method which certainly sounds simplicity itself. A friend of ours, inspecting some photographs of Royal personages which purported to be from original sittings, remarked, authoritatively, "Those photographs must be taken *cum grano salis!* they must indeed." He may be right, but the new method of making pictures with chloride of sodium sounds more suitable for marine news.

They receive all kinds of suggestions at Scotland Yard, and amongst those sent in there last week were two which have, at any rate, novelty to recommend them. One was that all policemen on night duty should wear over their ordinary blue tunic a coat (or great coat, as the case might be) of luminous paint, thus rendering a constable a bright and shining light, and a new terror to those who love darkness for reasons of a not altogether unfelonious nature.

But the second has novelty, but not so much. It proposes that all policemen going on duty should carry about them the means of obtaining the portrait of any suspicious character they chance to see on their beat: as it is, they often suspect where they cannot arrest, and the man suspected takes himself off. In future it is urged that the policeman should be in a position to take him on a prepared plate for purposes of subsequent identification, &c. A number of other suggestions as to the notion are given which we need not reproduce. The fact remains that it would be undoubtedly useful if our guardians could "take" a man without "running him in."

Regulations are pending, it is rumoured, which, if satisfactorily carried out, will result in all visitors to the Inventories, or Invenstrumentories, or Artificiers, or whatever the next exhibition is to be called, being provided with a "square meal," having their photograph and weight taken, their hair brushed, boots polished, and receiving a picture of "Old London," and all for the sum of one shilling!

A somewhat important communication was made at the last meeting of the Royal Astronomical Society by Professor Pritchard. Some time ago there existed a difference of opinion as to the relative light capacity of reflecting and refracting telescopes of the same aperture; comparisons were made, and the question was apparently settled to the advantage of neither system. But during the eclipse of the moon an occultation of four faint stars was observed, and of these only one was noticed with De la Rue's 13-in. reflector, while the other three were clearly perceived with the Grubb reflector of 12¼-in. aperture. Professor Pritchard was led to make experiments, and he has authoritatively fixed that the light transmitted by the Grubb refractor is to that received by the De la Rue reflector as 1·89 to 1. The importance of this fact to photographic observations was at once perceived by the meeting, and questions were asked by Lord Crawford and Mr. De la Rue on the subject. As Professor Pritchard remarked in his reply to Lord Crawford, "An investigation as to the relative photographic power would be interesting."

Mr. Zeitheim Focsani, the son of a photographer in the town of Roman, announces through the Berlin *Wochenblatt* his readiness to give his hand and heart to some young lady who is experienced in retouching. Applicants should not be over twenty-three years of age; ought to be of unblemished character, mild in disposition, and domesticated; but before all these qualifications comes good retouching as an essential. Parenthetically, Mr. Focsani adds that young widows without children, but with means and business experience, will not be altogether excluded from consideration. It is only reasonable that any fair reader who is disposed to compete for the double appointment should know that the advertiser describes himself as twenty-five years of age, *blond*, and not ugly. Letters should be addressed "Herrn Zeitheim Focsani, in Rumänien," and a photograph must be enclosed. But has the advertiser considered how woefully a skilful *retoucheuse* might deceive him with this latter?

Quite an old phase of the application of photography to matrimonial purposes has lately been revived in the suburbs of London.

A well-dressed gentleman seats himself in a railway carriage, and turns over the pages of a well-filled album; presently he hands it to his fellow-passenger with a few general remarks about photography. The well-dressed gentleman is a matrimonial agent, having offices in the Strand, and the portraits in the album are those of his clients.

Patent Intelligence.

Applications for Letters Patent.

15,202. William Griffith Honey, 3, High Street, Devizes, Wiltshire, for "A new or improved holder for manipulating a photographic plate."—(*Complete Specification.*)—Dated 19th November, 1884.

15,307. Hezekiah Nelson Heffner, 53, Chancery Lane, London, W.C., for "Apparatus for illuminating sitters and subjects to be photographed, and for other purposes."—Dated 20th November, 1884.

15,440. CHARLES GRAY and HENRY KEMP, 36, Southampton Buildings, London, W.C., for "Improvements in magic lanterns."—Dated 24th November, 1884.

Patent Sealed.

10,226. BENJAMIN JOSEPH EDWARDS, 5, The Grove, Hackney, Middlesex, Photographer, for "Improved apparatus for dissolving and changing pictures in the magic lantern."—Dated 16th July, 1884.

Specification Published during the Week.

8. FREDERICK WILLIAM HART, of 8 and 9, Kingsland Green, London, in the County of Middlesex, Manufacturer of Scientific Apparatus, for "Improvements in portable photographic camera." Dated 1st January, 1884.

I first construct the front framework of the camera in square or other rectangular form, such framework having a revolving flanged disc of the greatest diameter the framework will permit; such disc has an opening through it, half its width below the centre to near the circumference, the width being of such dimension as will permit the lens tube to be centrally placed and moved freely along the opening to near the circumference. On this revolving disc I place a slide diametrically over the opening, and of such length and width as will well cover the opening when the centre of the slide is brought over the opening near the circumference; on this slide the lens is to be mounted. I fix the disc and slide in any desired position by means of screws or cam clamps with my improved folding disc heads to such screws or cam clamps. The construction:—On the shank is a disc of metal, and across the diameter is hinged a half disc of like thickness which, when raised, enables the screws, cams, or racks and pinions to be actuated. When folded down, the whole does not project from the body of the camera more than one-eighth of an inch, thus permitting close packing, whereas the screw-heads at present in use project half to three quarters of an inch, thus preventing compact packing. The back framework and the flexible extending body is constructed as usual, with the exception that I employ my folding disc heads to all clamping screws and pinion heads. The advantage in using the said disc heads will now be seen in my main improvements to obtain extended range for lenses of long focus. I shut the body—as above described—up quite close, together with one or more dark slides, or a magazine plate-holder included, and form around them a casing, embracing the top, front, bottom, and back, three of these rectangles being hinged, and the fourth angle secured by lock, bolts, or hooks.—This, my improved baseboard, when unfolded, is made rigid by triangular bolts of metal—steel or bronze preferred—sliding in grooves in opposition to the hinges, means being provided by the enclosing plate for taking up wear so as to ensure continuance of the utmost rigidity. The camera body frame slides to and fro on this base board, being kept parallel by side guides in the ordinary manner. On the top face of the base board I employ two short lengths of rack—when weight is of moment—say one-sixth of the length of the base board, the solid base of which is V or half V, on the sides, with corresponding counterparts for them to slide in the base board. The end of each portion of rack has a spring detent pin in use at the time. Where weight is not an object, the metal rack may be fixed the entire length and cut at the joints for folding.

By these recited improvements I obtain greater range for focussing than hitherto; economy of space, rigidity, a square body throughout, thus making the camera available for lenses of short focus, including angle of 90 to 100° of subject on the plate, as well as narrow angle lenses of long focus for extreme distant objects.

As an illustration of improvements effected:—The latest tourist's cameras exhibited—say half-plate—have a range of focussing power of 12 to 16 inches, whereas, with my recited improvements as set forth in this specification, I obtain 24 to 26 inches focussing power, giving thereby greater facility for the production of artistic photographs from nature, also for copying.

934. WILLIAM HENRY DUNCAN, of Coalbrookdale, in the County of Shropshire, engineer, for "Improvements in apparatus for changing dissolving views." Dated 8th January, 1884.

This invention refers to changing slides and adjusting the dissolver by means of pedals, the claims being for:—

First. An apparatus for changing the picture slides of a dissolving view, or magic lantern, by pedals, moved by the feet or by levers, moved by the knees or hands of the operator.

Second. An apparatus for raising and lowering the light by pedals.

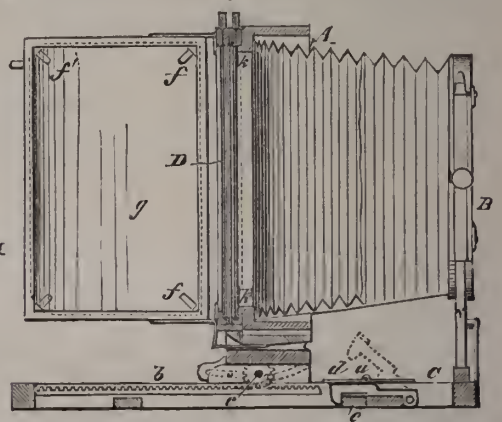
Third. The locking device for the pedals, substantially as described, and illustrated by my drawings and specification.

9026. HENRY GARDNER, of 166, Fleet Street, in the city of London, Patent Agent, for "Improvements in producing from photographic negatives, blocks or plates suitable for typographic printing."—Dated 16th of June, 1884.

The object of this invention is, attaching by any adhesive substance a film or sheet of any material which has been impressed with the form of an engraved surface, capable of printing in a typographic press a series of marks, producing the effect of an even tint or shade to a relief produced by photographic means; and the rubbing or pressing the surface thus produced with some straight or plane surface, with the effect of increasing the size of the marks on the raised portion of the relief, and consequently rendering them capable of printing a series of marks having the effect of a darker shade or tint than the rest, the surface produced being thus capable of printing in a typographic press a series of marks large in the darker portions of the picture which it is intended to reproduce, and smaller in the lighter portions.

Patents Granted in America.

307,965. WILLIAM H. LEWIS and ERASTUS B. BARKER, New York, N.Y., assignors to E. and H. T. Anthony and Co., same place. "Camera."—Filed May 2, 1884. (No model.)



Claim.—1. In a camera having a hinged or folding bed, the means, substantially as described, for holding the bed in position for use, consisting of hooks pivoted below the hinge, so as to bind the parts as specified.

2. In a camera, the combination of hooks, *d d*, with hinged bed-frame C, substantially in the manner and for the purpose specified.

3. In a camera, the corner-clamps *f*, formed with tongues *f'* combined with the object-glass and frame, substantially as and for the purpose specified.

4. In a camera, the combination, with the object-glass and frame, of spring holding-clamps, substantially as described.

5. The camera-box having a rib or flange, *k*, at the edges of the opening, combined with a plate-holder having an opening large enough to receive the rib, as specified.

6. A camera-box made with a rib or flange adapted to enter the opening of the plate-holder for retaining the holder in place, as specified.

FRENCH CORRESPONDENCE.

PHOTOGRAPHIC SOCIETY OF FRANCE—PHOTO-GRAVURES FROM DETAILLE'S DRAWINGS—ENGLISH SHUTTER—SUBSTITUTE FOR A CAMERA—ROTARY SWING MOTION FOR LENSES—NEW FIXING SOLUTION—DROP SHUTTER EXPOSURES—STANDARD SENSITOMETER—GELATINO-BROMIDE CARDBOARD PLATES.

Photographic Society of France.—This Society has recommenced its monthly meetings after two months' holiday; consequently, there were many communications brought forward, which I will review successively.

Photo-Engravings of Detaille's Drawings. — The old-established house of Goupil and Co. has changed hands, and the firm is now Boussod, Valadon, and Co. The first

result from the new house is an album of phototype reproductions of a splendid collection of drawings by Detaille, the battle painter. The process employed is no longer the granular method of which we have seen such fine specimens by Messrs. Goupil, but has a square network, like Manzi's process, by which the negatives are more easily printed in with the text.

English Shutter.—Among our amateurs, many use shutters of English make. They are generally excellent in construction, but rather heavy; that shown by M. Arwin is of that kind. It works with a central opening, giving different lengths of exposure.

Hat Used as a Camera.—One of our professional photographers, M. Marco Mendoza, has had the idea of utilizing a round felt hat as a camera. The lens is placed through a hole in the crown, and an oval framework to receive a ground-glass slide or dark-box is fitted accurately in the inside. A socket fixed to the brim enables it to fit on the top of a light metal tripod. The idea is not new, and it is far from perfect at present. If I mistake not, some similar experiments were made in England.

Rotary Swing Motion for Lenses.—M. De Thierry desired to replace the swing-backs of cameras by a rotary swing motion given to the lens, so that it may be brought round in any direction. The lens is fixed in a ball-and-socket joint. It is needless to mention that one cannot set the lens in a slightly oblique position without danger of distorting the object.

New Fixing Solutions for Prints.—Dr. Liesegang has been experimenting in search of another fixing substance for prints besides hyposulphite of soda. His efforts result in a mixture of common salt, chloride of ammonium, and ammonia. The action is much slower than hypo, but he is continuing his experiments so as to improve his formula.

Lengths of Exposure given by a Drop-Shutter.—In my last letter I spoke of the apparatus I used in connection with Boca's chronometric shutter for measuring the length of exposure given by instantaneous shutters. The following is a series of experiments made with a drop-shutter, with aperture from 5 millimetres to 9 centimetres, and lens 25 millimetres.

Aperture	5 millimetres,	length of exposure	$\frac{1}{100}$	of a second
,,	1 centimetre	,, ,,	$\frac{1{\cdot}5}{100}$	,,
,,	2 centimetres	,, ,,	$\frac{2}{100}$	,,
,,	25 millimetres	,, ,,	$\frac{2{\cdot}5}{100}$	,,
,,	3 centimetres	,, ,,	$\frac{3}{100}$	,,
,,	4 ,,	,, ,,	$\frac{3{\cdot}5}{100}$	,,
,,	5 ,,	,, ,,	$\frac{4{\cdot}5}{100}$	,,
,,	6 ,,	,, ,,	$\frac{5}{100}$	,,
,,	7 ,,	,, ,,	$\frac{5{\cdot}5}{100}$	,,
,,	75 millimetres	,, ,,	$\frac{6}{100}$	,,
,,	8 centimetres	,, ,,	$\frac{6{\cdot}5}{100}$	,,
,,	9 ,,	,, ,,	$\frac{7}{100}$	,,

It will be noticed that with apertures equal to the diameter of the lens, then two or three times greater the following relations will be seen $\frac{2{\cdot}5}{100}$, $\frac{4{\cdot}5}{100}$, $\frac{6}{100}$ of a second, only it is much more advantageous to use a large aperture and a spring to give greater impetus to the slide. Thus, an opening of 5 millimetres gives an exposure of only 1-100th of a second, but using a larger aperture and a spring reducing the exposure to the same as the first, and comparing the two results, the second will be found much more complete.

Standard Sensitometer.—One is still seeking after a perfect sensitometer, but for my part I hold to that of my sympathetic and clever colleague, Warnerke, until the day comes for absolute perfection, as it is very precise for practical purposes. I have an idea of adding to it a scale for various colours, of which I will write another time.

Gelatino-Bromide Cardboard Plates.—M. Thiebaut has invented a new system of gelatino-bromide plates by spreading the film on thin cardboard, so that one hundred do not weigh more than a dozen plates of the same size. The cards in question are as rigid as glass; they are developed, and the film stripped off when completely dry, which operation takes a somewhat long time on account of the quantity of liquid absorbed. I think the substance might easily be rendered impermeable. I am going to try some experiment with these plates, and then I shall not hesitate to give my opinion.

Leon Vidal.

THE DUBLIN EXHIBITION.

Second Notice.

The voting of the members for the prize medals concluded on Saturday evening, and the results are as follows:—

Landscape, 8½ by 6½.—A—T. A. Greene, "Grasmere and Rydal" (227)—silver. G. Mansfield, "Pas de Roland, Pyrennees" (76)—bronze.

Landscapes under 8½ by 6½.—B—W. F. Donkin, "Views in the High Alps" (186)—silver. H. B. Berkeley. "Noontide" (523)—bronze.

Instantaneous.—C—G. West and Sons, "Yacht Studies" (14)—silver. M. Auty, "Shields Harbour" (446)—bronze.

Interiors.—D—E. Brightman, "Mansion in the Olden Time" (494)—silver. A. G. Tagliaferro, "St. John, Malta" (541)—bronze.

Portraits, 8½ by 6½, and over.—E—J. Chancellor, "Il Penseroso" (213)—silver. J. Lafayette. "Portraits" (203)—bronze

Portraits under 8½ by 6½.—F—J. Lafayette, "Portraits, Boudoir" (239)—silver. J. Robinson and Son, "Portraits" (271)—bronze.

Opals.—G—J. Robinson and Son, "The Sisters" (454)—bronze.

Genre Pictures.—H—W. Gillard, "Reading to Granny" (450)—silver. C. Wyrall, "Peg in the Ring" (128)—bronze.

Enlargements.—I—Autotype Co., "Sorrow on the Sea" (210)—silver. J. Robinson and Son, "H.M.S. 'Cupid'" (82)—bronze. *J*—P. H. Fincham, "Lantern Slides" (715)—bronze. *K*—Rud. Schuster, "The Autodafe" (mechanical process, 7)—bronze. *L*—T. J. Dixon, "Animals" (108)—bronze. *M*—R. A. Hayes, "Micro. Photos." (731)—bronze. J. V. Robinson "Cameras"—bronze. *W*—G. Mansfield, "Sauveterre, Pyr. (71).

Special medals have been awarded to Messrs. Skeen (for his series of Ceylon views), Mendelssohn (for group No. 97, the class having been inadvertently omitted in voting list), and Renwick, for "Frost Study" (No. 152).

Continuing our remarks on the various exhibits, we notice that the School of Military Engineering, Chatham, sends several frames of charming scenes, chiefly in Devonshire and the Lake District (6, 263, 493). The last-named are platinotypes, "Stybarrow Crag, Ullswater," being surpassed by few landscapes in the room. Besides "Reading to Granny" (silver medal), Mr. Gillard shows "The Miser," from *Les Cloches de Corneville*, also a master-picee of pose and expression. Mr. T. G. Whaite has a large number of frames of little pictures of Breton life, bright and lively; but there are so many as to become slightly monotonous. Messrs. Marsh Brothers show their well-known views of Henley Regatta, and their studies of swans and pigeons, Medmenham Abbey, &c. Mr. Jackson, of Perth, sends, besides an album on the table, several frames of woodland studies; a weeping elm, Dunkeld, is among the best.

Professor Donkin's enlargements are always attractive; of these he forwards several—the Weisshorn, Matterhorn, &c. Mr. Wyrall's "Peg in the Ring" (128) has obtained a medal, and is an interesting group of boys at play. A. Diston has his well-known "Out of Sorts" (337), and "Gloamin'" (332). Mr. Suteliffe's frames of shore and boat studies are very attractive, and the plain oak mount sets them off admirably. Besides "There's Sorrow on the Sea" (silver medal), the Autotype Company have sent a most interesting series of their works, including reproductions of pictures, coins, fans, &c., as well as a frame illustrating the various stages of Collotype. The Woodbury

Company do likewise with Stannotype, and Mr. Schuster, of Berlin, sends a magnificent series of photo-etchings. These have deservedly taken the medal for mechanical printing. Portraiture is well represented, for in addition to Lafayette, and Chancellor, already noticed, Messrs. Robinson and Sons of Dublin, Debenham of Ryde, and Byrne of Richmond, are exhibitors; Mr. W. England contributes numerous scenes in Switzerland, chiefly on the St. Gothard route.

Mr. Brownrigg, of Guildford, is an exhibitor, and shows excellent studies of his native Surrey lanes, as well as of the Rialto, the Grand Canal, and other places in Venice. Some of these he tells us are instantaneous. Why he took them so is hard to see, as there do not appear to be many moving objects in the scenes depicted. Mr. H. Symonds, of Portsmouth, has two capital frames (196, 212) of yachting pictures, running Messrs. West very closely, and, like theirs, taken from a sailing boat. Three views in frame (196) are greatly spoiled by the vignetting; they would have looked far better with the natural border of sea and sky. In the other frame, several pictures show wonderful "go"; and one showing a topmast just gone by the board is most happy as a picture, though doubtless not so to the owner of the boat.

Mr. Godbold has some of his dashing sea studies, especially that of the "Rocket." Is the rope quite untouched? No. 425 is an interesting relic lent by Mr. H. Grubb, F.R.S. It is a group of the original Photographic Society of Ireland, which came to an end long ere the present one was started.

Mr. C. K. Dalton sends some nice landscape and cloud studies, chiefly from Lancashire. Messrs. Morgan and Kidd show examples of their enlargements on paper, canvas, and opals, and two instances of prints from negatives on their special negative paper. Messrs. York and Son, P. H. Fineham, Englard, and J. L. Robinson, show frames of lantern slides, for which Mr. Fincham fairly wins his medal.

In what may be termed "Miscellaneous" work, Mr. Woodworth has two good frames of micro-photographs of insects, diatoms, &c., but Dr. Haye's anatomical specimens, printed in colours by the Woodbury Company, are marvellous reproductions of minute structure. Mr. A. W. Wilson sends a huge frame (136), of peculiar design and most difficult to hang, containing "Studies of the Seven Ages of Man," photographed from life. Some of them are extremely good, but are of a decidedly brown tint.

The Platinotype Company, besides Mr. Berkeley's private exhibits, have a considerable series, illustrating both the ordinary and the sepia processes. The best are views of the Alhambra (316), and heads by Mr. Blanchard (363, 443, 457, &c.) Mr. J. B. B. Wellington shows several exceedingly pretty bits of country life and Thames scenery.

Spectroscopists will be interested in frames Nos. 704, 705, and 706, sent by Professor Hartley, F.R.S., and containing spectra of a large number of elements; the photographs have been enlarged from small negatives by the Autotype Company. Mr. H. Robinson, of Dublin, shows his patent camera—a form which has met with considerable appreciation in Dublin—and will no doubt, ere long, make its appearance on this side of the Channel; for lightness, compactness, and range of motion, it is remarkable. He also shows a new series of interiors and views in the Palm House, Glasnevin Botanic Gardens.

Mr. Dixon sends some wonderful pictures of Lions, Leopards, &c. The Tiger's Head, an untouched enlargement, life-sized, from a tiny negative, is a marvellous work. No. 108 takes a medal.

We regret we must leave many pictures and exhibitors unmentioned, even by name; this is unadvoidable when the number of exhibitors is 135 and the exhibits over 700. We trust the Photographic Society of Ireland will be encouraged by their success this year to try their fortune again, and would suggest that it might not be amiss to follow the lead of Bristol, and make the Dublin Exhibition an international and triunial reunion.

SOURCES OF FAILURE IN PRINTING ON ALBUMENIZED PAPER.

BY H. TRAUT.

In the current issue of the *Mittheilungen* M. Traut makes some interesting observations on the "pit-falls" which are often met with in silver printing. For some years past the double albumenized paper has come more and more into favour, from its power of producing a brilliant surface. Few, however, have any idea of the many disadvantages which are incidental to so liberal a use of albumen. Creasing and tearing of the film, and the discolouration of the latter in the space of two or three years, are of frequent occurrence. Moisture spoils the double albumenized paper very rapidly; and what is, perhaps, worse, the moist paper contracts very much on drying. Thus, during printing, if the paper is still moist, the print, when dry and finished, will present a distorted appearance. In sensitizing, through the expansion of the albumen film, the paper curls outwards, but on drying it contracts.

The contraction of the paper almost entirely takes place in one direction, namely, along the length of the paper as it issues forth from the machine. For this reason the distortion in portraits is less noticeable when the paper is so cut that the height of the picture corresponds to the length of the material. As an example of the enormous distortion which is sometimes met with in albumenized prints, the writer, on measuring the length of the head in a C.D.V. bust portrait, found it to be 22 m.m. in length, but on the negative the length of the head was only 20 m.m., thus the print showed an extension of 2 in 22, or nearly 10 per cent. Again, in a full figure print, the length of the model measured 154 m.m., while in the negative it was only 148; the width of the two were, however, identical. It is hardly necessary to remark that such a distortion cannot be without effect on the likeness. The writer has also experimented with the tinted albumenized paper. It is well known that manufacturers generally employ aniline dyes for the purpose, which, although very beautiful for a time, very soon fade; while madder, which is known to be permanent, is rarely used.

Various samples obtained from Dresden, Vienna, and Paris were "sunned" for four days; after which time, the beautiful rose and violet colours had in all cases given place to an unpleasant yellow. Is it surprising, asks the writer, that pictures produced on such paper lose their original freshness after one month's exhibition in a show-case? The writer concludes by advising photographers to take up the collodio-chloride process; for according to Herr Hoster's experience, the single objection to its use—namely, the tending to irregular toning—has now been removed by reducing the thickness of the paper support.

TELESCOPES FOR ASTRONOMICAL PHOTOGRAPHY.*

For the refractor two disks of glass are required; they must be optically pure, and their first cost alone is more than is often spent on the reflector, including the mounting. These disks must be wrought on four surfaces to proper curves, and time often spent afterwards in perfecting the object-glass; when this is done, the cost is found to be so great that it is felt to be worth a costly mounting. We cannot then be surprised that the better made and mounted telescope should be chosen, but that does not decide the question, Which is the best optical instrument? Nor can this question be decided definitively, because the images formed by each differ. If we look with a reflector at a bright star, the image is seen as an intensely bright point of light, dazzling to the eye if the telescope is large, and we see rays or coruscations round it of an irregular shape that are never steady. I think this effect is not due to the telescope, but is entirely subjective, and caused by this extremely small point of light exciting only a very small portion of the retina; for by proper precautions the light can be reduced, and these rays and the dazzling effect got rid of. With stars less bright it is not so pronounced, and on planets or objects of sensible magnitude it ceases entirely. The image of such a

* Continued from page 749.

bright star in the refractor is quite of another kind: it is seen as a small disk of light of sensible diameter surrounded by the well-known system of diffraction rings and outstanding colour. This disk of light, though small, has a different effect on the retina; it can be seen as a shape, pretty steady and free from too much dazzling glare. It is here that the refractor has such an advantage for micrometrical work, permitting bisections to be made with such precision.

The adjustments of the object-glass are considered more constant than those of the speculum, and though the troubles attending the reflector are much exaggerated, they have existed in the arrangements usually adopted. For certain instruments such as the transit-circle, where the connection between the optical axis and some part of the instrument has to be maintained, the object-glass is superior to the speculum; a tilt of the former that would not have an appreciable effect on the position of the image of a star would in the other displace this image twice the amount of tilt.

Both kinds have certain advantages, according to the use they are put to, and it is really not of much consequence which is the best instrument of this size. It is when we begin to consider the effect of increased size and all its attendant difficulties that the question of the suitability of either for the purpose of photography has to be answered.

With the reflector increase of size means proportionate increase in other qualities, in light-grasping power, in defining, and in separating power. With the refractor the greater absorption of light due to increased thickness reduces the light-grasping power, and definition becomes a matter depending not upon the optician, but upon the glass-maker; the correction for colour, which even in theory is approximate only, becomes more difficult, and the defects due to the necessarily imperfect correction become more apparent—and these two facts alone show that as the refracting telescope gains in size it becomes more and more unsuitable for photography.

Moreover, when the aperture of the two kinds of telescopes under consideration is the same, the focal length of one must be something like twice that of the other, and that means that the image is four times less bright, and there does not seem to be any indication that the focal length of refractors can be very much reduced. This is only one part of the question; the next and most important one is that of actual cost or difficulty of construction. In the case of the refractor the preliminary difficulty in getting the lumps of glass out of which the lenses have to be made is so great that the increase of the size beyond 30 inches seems at the present moment very doubtful—they may reach three feet or even four feet aperture, but it is most unlikely: the cost alone, good or bad, would be simply enormous, and such a size may be for the present left out of consideration. With the reflector the case is entirely different; from what has been said, it is easy to see that the gain by increase of size is proportionate here, and that only mechanical difficulties have to be met. Mirrors of glass covered or coated with silver for the reflecting surface are now in existence of three and four feet apertures; larger are in hand, and can be made at a cost absurdly below the cost of even a possible refractor; the only limit that I can see here is that of glass, and the limit in this case stops not at thirty inches, as with the refractor, but at something like seventy inches, and that and nothing else of a constructive character prevents the reflector being made much larger, and size is a great thing in photography. It is, in the case of eye-observation, a fact that you could positively have a telescope too big for the eye to use, but any increase that is at present possible in the reflector would only add to its photographic power.

The optical arrangements of the reflector are so varied that I propose to treat of them in detail for the purpose of indicating the most suitable.

Correspondence.

THE STRICTURES ON THE IDENTISCOPE.

Sir,—I have to thank you for the courtesy extended to me. Pray can you spare a corner for a brief summary of my rejoinder to the demurrer raised?

I have to reply to Mr. Galton as follows:—

1. The portraits are not "drawings," but high-class life-size photographs by Maull.

2. The combined photographs do not show any confused "blending." This is conclusively evidenced by the perfect restoration of the lines of admeasurement and the other details at that part of the visage where a defined and material section has been intentionally removed from one of the portraits.

3. Thrown upon a 24 feet surface by oxyhydrogen light, not a vestige of discrepancy results between the measured details.

4. A visit to the nearest photographer's will refute, on the instant, the allegation that the iris is not a trustworthy unit. Moreover, various eminent oculists, to whom the matter has been submitted, have conceded that the iris, unaffected by disease, affords a permanent and perfectly reliable unit of admeasurement.

"The iris, at its exterior circumference, is a permanent quantity in a given individual." The rim of the iris, in a well-executed enlarged photograph, is as reliable and as well-defined as the rim of the gilded porcelain from which the learned professor sips his afternoon beverage.

Bristol. William Matthews.

ART AND PHOTOGRAPHY.

Dear Sir,—You were good enough to make a selection of the largest portion of my address to the Edinburgh Photographic Society, to establish "Conferences on the Picturesque." To show how much the effort on our part is appreciated, I beg to enclose a kind note which I had from Mr. H. P. Robinson on the subject. He very kindly offers to send some photo. pictures for criticism at our first meeting. Such an example is very encouraging to others not to be afraid, but rather court opinion.

The two great objects of photography are *science* in its chemistry, and *art* in its arrangements. The former appears to me to be much ahead of the latter, and such a scheme as we intend prosecuting will, I trust, do not a little to promote sound views of proper treatment of the Picturesque.

Norman Macneth, R.S.A.

In the letter alluded to by our correspondent, Mr. H. P. Robinson says:—"In your capital address to the Edinburgh Society, you say 'we cannot look for examples for discussion from professional men unless they are pleased to be generous enough.' I take this as a hint. Would you like to have a selection of my pictures for the purpose? If so, when would you like to have them, and where shall they be addressed?

Allow me to take this occasion to express my appreciation of the sound advice in Art you give to photographers, and to thank you for the kindly notice you have taken of my endeavours in the same direction."

*** An article on this subject will be found on page 757.

LANTERN SLIDES.

Dear Sir,—In the interesting account of the lantern slide processes given in your last issue, it is stated that surprise was felt at the meeting that pure carbon should yield brown-coloured transparencies, lampblack being the form of carbon employed; it may therefore interest some of your readers to learn that a carbon print on paper from tissue made with this substance is brown, and not black, as might be expected. I believe the difference in colour of various forms of carbon arises only from the degree of fineness of the particles, and it is probable that lampblack obtained by collecting the soot from an oil lamp yields carbon of the finest kind possible.—Yours faithfully,

W. L. Noverre.

THE NORTHAMPTON EXHIBITION, 1884-5.

Dear Sir,—May I call the attention of those of your readers who intend exhibiting at our forthcoming exhibition, to the fact that the last day fixed for receiving exhibits is December 1st?

To prevent the possibility of any pictures being shut out, cases must be sent on at once.—I am, yours faithfully,

T. Manfield, Hon. Sec.

ELECTRIC LIGHT FOR THE LANTERN.

SIR,—I am glad to find that Mr. Dresser proposes to initiate a discussion upon this important subject, and if any convenient method of using the electric light is the result, I, for one, shall feel much gratified. Of course, at such a place as the Royal Institution, or the Society of Arts, where an engine and dynamo are available, there is no difficulty; and the result is all that one can wish for. Indeed, I have a lively recollection of the perfection and brilliancy with which Mr. Muybridge exhibited his "horse in motion" at the first-mentioned place.

What is wanted is some arrangement which involves less work than the charging of 50 or 60 cells of Grove's battery; a task equal to making preparations for three or four lime-light exhibitions. JOHN M. GORMAN.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

ON Tuesday last, the 25th instant, the mouthly technical meeting was held in the small room attached to the Gallery, 5A, Pall Mall East, Mr SEBASTIAN DAVIS occupying the chair.

Mr. FRANCIS COBB showed some gelatino-bromide plates in which the reduction of the silver was remarkably complete, the surface of the films being almost mirror-like, but very little or no trace of image was visible. These plates had beeu developed with a soda and pyrogallic developer, the development being much forced; but Mr. Cobb gave no particulars as to the preparation of the plates.

The CHAIRMAN, in connection with this subject, said that he never obtained such complete reduction of the silver, or such dense images with the soda developer, as when he supplemented the action of the soda with a dash of ammonia towards the end of development; but Mr. Cooking, on the other hand, had found that he could get all the required density with soda only.

Mr. WARNERKE pointed out a circumstance of which many appear to be ignorant—namely, that a given quantity of bromide of potassium restrains much more powerfully in a potash developer than in an ammonia developer. As far as Mr. Warnerke's experience goes, there is special advantage in using both potash and soda in the same developer; but potash is to be preferred to soda, as it gives negatives of a better colour. As a general rule, it may be taken that with the potash developer there is less tendency to frill than when ammonia is used, and plates which give green fog with ammonia will show no trace of this when potash is used. In addition to these advantages, less exposure is required with potash, two more numbers on the sensitometer beiug generally obtainable when potash is used. Mr. Warnerke compounds the developer as follows:—

No. 1.—Potassium carbouate	45	parts
Sodium sulphite	12	,,
Water	1000	,,
No. 2.—Pyrogallic acid	12	parts
Sodium sulphite	24	,,
Citric acid	2	,,
Water	1000	,,

For a normal development, equal proportions of No. 1 and No. 2 are used.

Mr. FRANCIS COBB, in replying to the Chairman, said that he had found potash to have some advantage over soda, as, when potash is used, the tint of the negative inclines more to a purplish-black, instead of the whitish-yellow tint obtained with the soda developer.

Mr. ASHMAN enquired whether any fresh experiments had been made with the hydroxylamine developer; but nothing transpired beyond what has already been published in the NEWS.

Mr. HOPKINS then exhibited his "simplex" dark slide, an apparatus which has already been explained to our readers.

Mr. GÖTZ then handed round some lenses constructed by Suter, of Basel; they are constructed on the well-known symmetrical or rectilinear type, and are fitted with flanges and diaphragms in accordance with the standards of the Photographic Society. The most rapid of these corresponds to a working aperture of $\frac{f}{6}$, making the instrument comparable to a portrait combination for speed.

Mr. DEBENHAM pointed out that it is of very doubtful advantage to construct lenses of the symmetrical type of such a degree of rapidity; the Petzval or portrait lens being preferable when an intensity of from $\frac{f}{4}$ to $\frac{f}{7}$ is required; and he further pointed out that his views were confirmed by the fact that opticians seldom construct "symmetricals" with an intensity so high as $\frac{f}{6}$

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 20th inst., Mr. F. W. HART in the chair.

A discussion in reference to the lantern slides shown at the previous meeting was opened by Mr. HENDERSON, who doubted the utility of such comparisons. Owing to the protracted and desultory nature of the conversation which followed, the Chairman, at half-past nine, adjourned the meeting *sine die*.

Mr. A. HADDON was theu appointed chairmau.

Mr. J. H. TRINKS enquired why silvered paper kept between the leaves of a printed book, and excluded from light, received an impression of the letter press?

Mr. A. L. HENDERSON attributed the circumstance to the action of deleterious gases in the air.

The CHAIRMAN held a similar opinion, and considered the greasy ink protected the parts beneath it as a varnish would do.

Mr. A. MACKIE spoke of printed matter marking varnished negatives, and insensitive marks due to contact with printer's ink was alluded to.

The value of paraffin paper as a covering for plate boxes was brought forward, Messrs. Henderson, Cobb, and the Chairman relating their experieuces with it, which was favourable to its employment.

Mr. A. COWAN had not found any ill effects from the use of white pine boxes after two years' packing, although common deal was detrimental. It was thought the turpentine in common deal accounted for those boxes marking gelatine plates.

Mr. HENDERSON spoke of a peculiar mottle in certain plates, which he attributed to thymol; when the emulsion was filtered through wash-leather, the marks were absent. His impression was, that thymol and water formed a clotted emulsion, which in filtering became broken up.

This led to an enquiry as to the probability of an alcoholic solution of thymol producing clots in a gelatine emulsion; but it was thought that thymol would not act in this manner.

Mr. W. E. DEBENHAM said 50 per cent. of alcohol would not coagulate an emulsion, but mottled marks might be expected.

Mr. HENDERSON had used 80 per cent. of strong alcohol without getting these marks.

Mr. W. M. ASHMAN had coagulated a citro-chloride emulsion so that it was impossible to melt it; but he was uot certain whether it was by the addition of alcoholic thymol, or an excess of a citrate salt.

Mr. DEBENHAM said one of the greatest difficulties in working citro-chloride emulsions was due to the coagulation caused by certain citrates.

In lieu of thymol, oil of cinnamon, camphor, and bichloride of mercury were suggested. The latter, Mr. HART said, could be diluted to the extent of one part to one hundred thousand, and was the best antiseptic known, being more destructive to the lower organisms than any other poison.

Mr. TRINKS recommended pyroligneous spirit; he had preserved some microscopic specimens in this spirit for seven years.

Messrs. G. A Davenport and G. V. J. Perrin were elected members of the Association.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE first general meeting of the session was held in the Religious Institution Rooms on Thursday, 13th November, the chair being occupied by Councillor ROBERTSON, who congratulated the meeting on having such a large attendance. The minutes of last meeting were read and approved of.

The next business on the list was to appoint a secretary in room of Mr. J. Craig Annan, when Mr. John Lennox was unanimously chosen.

Owing to Mr. J. Y. McLellan's departure to Russia, a vacancy was made in the Council, to fill which Mr. Patrick Falconer was appointed.

Mr. WM. LANG, jun., kindly offered to present members of the Association with a view of Cadzow Forrest, taken at last out-door meeting. The offer was accepted, and a cordial vote of thanks given to Mr. Lang.

Mr. Falconer proposed that there be a discussion at next meeting on "The Best Medium for the Dark Room," which was agreed to.

The Chairman then called on the Treasurer (Mr. Geo. Bell) to read his annual report, which showed a balance in his hands of £8 3s. 4½d.

A vote of thanks to the Chairman brought the meeting to a close.

Birkenhead Photographic Association.

The preliminary meeting was held on Thursday evening, 20th of November, at Berry's Grand Restaurant, Argyle Street, Birkenhead, Mr. John H. Day in the chair.

The undermentioned gentlemen were elected to conduct the business of the Association for the ensuing session :—

President—J. A. Forrest.

Vice-President—H. N. Atkins.

Treasurer—J. Maurice Jones.

Council—A. W. Beer, A. W. Cornish, R. W. Hill, T. Cragg, James E. Newall, and H. P. Phillips.

Hon. Secretary—John H. Day, 19, Milton Road, Birkenhead.

Thanks were given to Mr. Richard Hartley and Mr. C. Berry, the former of whom has placed his studio in Market Street, and the latter a room in his establishment in Argyle Street, at the disposal of the members for the purpose of holding their monthly meetings, &c.

The competitive element having proved a beneficial stimulus to the production of good work in kindred societies, periodical competitions were decided upon, the result of which it was proposed should be duly reported in the newspapers. It was also determined, should the funds of the Society permit, to present each subscriber annually with an enlargement, if possible, from some selected negative, the production of a member of the Association.

Arrangements are in progress for a miscellaneous concert, concluding with a lantern exhibition, to be held on Thursday evening, the 18th December, on which occasion a number of original and interesting photographic pictures, the work of amateurs and others, will be thrown upon the screen.

North Staffordshire Amateur Photographic Association.

The annual meeting was held at the Mechanics' Institute, Hanley, on Wednesday, the 19th instant, Mr. Charles Alfieri occupying the chair.

Captain West-Jones, Major Harrison, and Mr. T. G. Keeling, were elected members.

It was resolved to permanently lease a suitable laboratory in the Potteries for the Society's use.

As only photographs 8 by 6 had been sent in from two sources for selection as presentation priuts, the Secretary was instructed to endeavour to to procure some of a larger size for the same purpose.

It was also resolved that albums and note-books on the models of the Postal Photographic Society should be circulated among members of the Society, who, in many instances, live some miles apart.

The financial report of the Treasurer showed a very satisfactory balance of funds in hand. The annual report of the Council was read and unanimously adopted. It congratulated the members on having passed another year of the Society's existence—a year which, although not so productive of results in out-door work as might have been expected from the exceptionally fine summer, had still not been barren of results so far as photography is concerned. Pace was kept with the times, even veterans having for once and for all laid aside collodion with its baths and dippers. The artistic platinotype, and, to a large extent, the argentic-bromide paper process, had found favour, while carbon had still some votaries, the users of albumenized paper being in a minority. The monthly meetings had not, as a rule, been favoured by the attendance of so many of the members as could have been desired ; but as they lived farther apart than is the case with societies in less sub-divided districts, a large attendance could not be expected in unfavourable weather. Some of the meetings had been very well attended. A list of papers that had been read, and articles exhibited, was then given. Only two out-door meetings came off—one to Barlaston, the other into Derbyshire, and even these were poorly attended. The gentlemen, however, who went had the satisfaction of bringing home several gems of pictorial beauty.

The Association, as originally started, was composed of photographers, both amateur and professional. However, for various reasons it was, at the June meeting, after mature consideration, resolved that in the future only those gentlemen or ladies who practise photography as amateurs be admitted into membership. The subsequent election as members of many well-known gentlemen of county notoriety and local influence had given to the Society a good social status.

The meeting was then adjourned.

Newcastle-on-Tyne and Northern Counties' Photographic Association.

The ordinary meeting was held in the College of Physical Science, Newcastle, on the 18th instant., Mr. J. B. Payne in the chair. The minutes of the previous meeting having been confirmed,

The Chairman said he thought they might congratulate themselves on the result of the exhibition they had held during the past week. The number of exhibitors might have been larger, but the quality of the work he considered very good. He then presented the medal, given by Mr. Borrow for the best set of three pictures taken by a member at the outdoor meetings, to Mr. J. P. Gibson, of Hexham, and the prize (a very handsome album partially filled with views), given by Mr. J. P. Gibson for the best set of two pictures taken by a member who had not previously received a medal or diploma, to Mr. Edgar Goold.

Votes of thanks were duly passed to the judges and to the hanging committee.

The presentation picture for the year was announced by the scrutineers to be one by Mr. Edgar Goold, *Bywell*, this picture having received the largest number of votes.

Mr. Laws announced that Mr. Garland had promised a second medal for the transparency competition.

Mr. J. Pike read an extract from the *Photographic Times*, which he thought might be of use to some of the members, viz. :—"Negatives showing a turbidness on parts of the plates, after removal from the alum bath, may be cleared by treating them with sulphide (?) of soda solution or weak sulphurous acid The turbidness is caused by a separation of sulphur in the alum bath, the sulphur being retained in the film." He (Mr. Pike) said he had frequently been troubled with such a deposit on the negative, but it was always removable with a pledget of cotton wool.

The Chairman said that he had been informed recently that benzole, containing a small proportion of resin, had the effect of removing green fog.

Doubts were expressed as to the part played by the resin in this matter.

Mr. Pae remarked that he had found benzole by itself answer the purpose. He also suggested the use of benzole for reducing the density of negatives, locally or otherwise.

A question was found in the box :—"With some plates the leather (hinge) of the dark slide gives an *opaque* marking, and with others a *transparent* one ; how can this be accounted for ?"

Several members had experienced trouble with their dark slides, the plates of some makers being apparently more easily affected than others.

Mr. Dodds remarked that a trace of ammonia in the leather might account for the opaque marking.

The Chairman said that he had found common writing-ink painted over the leather a complete cure.

Mr. Pike had recently been working with argentic-bromide paper, and, as a consequence of manipulating large sizes of paper in a very small room, had been troubled with an occasional marking or stain of a very disagreeable colour, with metallic lustre. He had always discarded a print when marked in this way, but had found that the marking was removed by a solution of hydrochloric acid—one part of acid to twenty-five parts of water. He suggested the use of this acid in preference to sulphuric as a clearing solution.

Professor Herschel said that he had also found hydrochloric acid a much superior clearing agent to the acid recommended by the makers.

Mr. Joseph Gray showed some transparencies taken on chloride plates of his own make. They were developed with the ordinary pyro. and ammonia developer, and were of a very pleasing tone. He said that any of the various developers in use—sulphite of soda, washing soda, &c., &c.—were applicable, and gave a variety of tones. The transparencies shown were favourably criticised.

Mr. Pike called attention to the very fine character of the

image, and said that the emulsion had apparently been carefully filtered. Some commercial chloride plates looked as if this operation had been omitted.

A paper on and demonstration of the platinotype process was promised by Mr. H. G. Templeton, of Gateshead, for the December meeting.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The annual meeting will be held at the House of the Society of Arts, on Thursday next, December 4th, at 8 o'clock. Several important matters in connection with the welfare of the Society will be discussed, and the election of officers for the ensuing year will take place. Intending competitors for the artistic competition are reminded that their pictures must be delivered between the 1st and 4th of December.

CITY AND GUILDS OF LONDON INSTITUTE.—On Thursday next, December 4th, the prizes and certificates won at the May Examination will be presented by the Right Hon. the Earl of Selborne, F.R.S., Lord Chancellor, at Fishmonger's Hall, London Bridge. The Lord Mayor is announced to take the chair at 7.30 p.m. A list of the candidates who were successful in photography will be found on page 497.

TESTING AND REPORTING ON COMMERCIAL PLATES.—Such dry-plate manufacturers as may desire to have their plates tested and reported on, can send samples to the Society of Amateur Photographers, 1262, Broadway, New York. In this country such a candid report as the Amateur Society of New York proposes to issue, would be almost certain to lead to actions for libel. In the United States, however, actions for libel are comparatively rare; the more practical process of administering a whipping to the offender being generally approved of. The Committee on Commercial Gelatine Plates consists of Mr. H. J. Newton, Dr. John H. Janeway, and Mr. Dexter H. Walker. We presume, however, that the President of the Society, Mr. F. C. Beach, takes an *ex officio* position on the committee.

REPRODUCING THE LINES OF MAGNETIC FORCE BY PHOTOGRAPHY.—The beautiful lines, produced with iron filings on a sheet of paper, under which is placed a magnet, have been successfully rendered permanent. Nickeles forms the lines on waxed paper, and then fixes them by placing a heated iron near enough to melt the wax. Meyer replaces the wax by shellac; but the result in both cases are not very permanent. Stevens has obtained excellent results by producing the figures on albumenized or other photographic paper, and exposing to light.

PHOTOGRAPHIC CLUB.—The subject for discussion on December 3rd will be on "Out-door Photography." There will also be an exhibition of photographs taken by the members during the past summer. Annual Dinner on Dec. 10th.

To Correspondents.

*** We cannot undertake to return rejected communications.

CARBON PRINTER.—Minute bubbles of air enclosed between the tissue and the collodion.

EDWIN MILES.—We remember the paragraph, but cannot tell you the date at which it appeared.

A. G. B.—1. The lenses appear to us to be of good quality, but not of the very highest attainable, and whether you have reason to be dissatisfied or not, must depend on the price you have paid. 2. As requested, we have attached your label, and forwarded the package.

T. R. YOUNG.—1. A few particles of fulminate, hardened by admixture with varnish, would certainly ensure its ignition; but you had better not try the experiment, as from your letter we can clearly see that you have not had sufficient experience to justify you in working with such dangerous materials. 2. We do not know: consult a lawyer, or enquire at a police court.

VERDANT GREEN.—Perhaps it is not what one might call a good shilling's-worth to one like yourself, but we have certainly seen worse.

J. WHITELAW.—1. It is not at all likely that you will obtain a set of working drawings of the best portable camera, especially as, in the first place, it is extremely difficult to determine which is the best; and the demand for the working drawings would not be sufficient to cover the considerable cost of their production. Any person of moderate mechanical skill can construct a good camera from such sketches as we have given. 2. Abney's "Instruction" is the best we know of.

G. F. WEBBER.—Our impression is that they are carrying on business, and we are surprised that no response has been sent to you.

PHOTO.—Cameras are occasionally made with an universal motion to the lens, but general experience is in favour of tilting the camera, and using the swing-back. We believe that Mr. W. E. Debenham has—in a somewhat lukewarm manner—advocated the former system. 2. The disadvantages are the great extent to which the front of the camera may require raising or shifting, and the mechanical difficulties in providing for this.

C. E. G.—Your suggestion is an excellent one, and shall be acted upon.

WILLIAM COLES.—We have not heard that a fresh edition is likely to be brought out soon, but a post card, addressed to the publisher, would doubtless settle the point at once.

M. C. H.—A hard, well-sized paper is coated with the following preparation:—

Water	300 parts
Gelatine	10 ,,
Perchloride of iron	20 ,,
Tartaric acid	10 ,,
Persulphate of iron	10 ,,

When dry, the paper is exposed under the tracing until the greenish-yellow tint of the paper has disappeared, except where covered by the opaque lines. Development is effected in a bath made by dissolving 20 parts of gallic acid in 200 parts of alcohol, and adding 1,000 of water. Fixation by simple soaking in water.

CLOUDLAND.—1. Not many persons besides Mr. Shadbolt have worked much in this direction, and of these very few have been successful; still, it is to be hoped that this important branch of photographic work will be developed in time. 2. As far as we know, the apparatus was never completed, but it is quite possible that the firm mentioned may possess the instrument in its unfinished condition. You had better write or call.

C. WILKINS.—Hydrofluoric acid is the only material available; it can be obtained in gutta-percha bottles from any dealer in chemicals.

MR. LAFAYETTE AND THE DUBLIN EXHIBITION.—Mr. Lafayette wishes our readers to know that he considers it a "glaring injustice" to publish such a criticism as ours before the award of the medals; and, moreover, he is highly indignant at what he calls the "provincialism," "petty localism," and "obvious unfairness" of our article. He also thinks that our article "must demonstrate, to any one giving the subject a moment's consideration, that the judgment was a foregone conclusion." It is by no means a novelty for the opinions of a critic to differ from those of an exhibitor; and if there were less pressure of important matter on our space, we would publish Mr. Lafayette's curious letter in full.

The Whittaker of the Photographer.'—*Chemical News*

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THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1370.—*December* 5, 1884.

LIBRARY

CONTENTS.

CLEAR GLASS IN THE SHADOWS OF GELATINE NEGATIVES.

MR. GEORGE SMITH, in a recent communication to the PHOTOGRAPHIC NEWS, touches upon a point which, although it may appear to be merely one of detail, is, in fact, one of the greatest importance.

Mr. Smith lays it down that, at any rate when the object is to produce a transparency, the negative ought to have perfectly clear shadows. He gives it as his reason, that if the detail in the deepest shadows is represented in the negative, it is all so much thrown away, because the whole range of detail, from the highest lights to the deepest shadows, cannot be reproduced in the transparency. Either the delicate detail of the high lights, or that of the shadows, must be sacrificed, and there is manifestly no good of getting in your negative what you cannot reproduce in your transparency. Moreover, by omitting the darkest detail of the shadows, we can get a better registering of detail in the high lights.

Now all this may apply, with more or less truth, to negatives for the production of transparencies—in fact, certainly does apply to those specially intended for the production of lantern slides; but in our opinion it does by no means apply to negatives from which ordinary prints are to be produced.

One of the things for which the photographer, and especially the amateur, is continually striving, is "clear glass in the shadows." We hold, that in making the attempt to get this he is mistaken: that with the dry plates of the present day a more truthful rendering of a subject will, as a rule, be got, unless the negative shows *no* perfectly clear glass but when there is a slight deposit even in the deepest shadows. If we are not very much mistaken, we remember Mr. Smith expressing the very same opinion some little time ago.

To explain one reason for considering that a negative which shows clear glass in the shadows does not give as good a rendering of the subject as one which has a little fog, we may take an illustration. The appearance of Warnerke's sensitometer tablets is now pretty well known to every photographer. It consists of twenty-five little squares, each presenting a slightly greater density than the one next to it. The difference of density between any two squares can be detected by the eye. It is evident that if a plate is exposed under this tablet, the portions which receive the least light—that is to say, which are behind the densest squares—represent in a manner the shadow portions of a plate exposed in the camera. Were the plate exposed under the sensitometer tablet, and afterwards developed, an exact counterpart of the tablet, or rather a correct inverse counterpart of it, the difference in density between each two squares of the developed plate should be the same as the difference of density between the corresponding two squares of the tablet.

Let us note, however, what will be the actual state of affairs. We expose for such a length of time that, when the plate is developed, the last one or two numbers of the tablet does not appear, but a certain portion of the plate remains as clear glass. We will now notice that the differences of density between the last figures which do not appear on the plate are very much less than the differences of density between the corresponding figures of the tablet. In fact, we shall probably find some three or four figures represented by a mere shadow of an image with scarcely any perceptible difference between the density of the first and the last. We have got anything but a true representation of the gradations of these squares of the tablet, and the same will hold good if, instead of so exposing a plate under a sensitometer tablet, that some clear glass is left, we had exposed a plate in the camera to a landscape, so some clear glass remained in the shadows. In the latter case the very blackest parts of the landscape have their true counterpart in the transparent portions of the negative, but the portions which are next in darkness to the very blackest do not have their true counterpart. They are represented by insufficient density. In fact, it is not the clear shadows themselves that are objectionable, it is the fact that with perfectly clear shadows there comes incorrect registration of the darker detail.

To return to our sensitometer tablet again, we shall suppose an exposure given which will cause an appreciable deposit on the last portion of the plate which has been under the last figure of the tablet. We shall find that in this case the difference between each two of the last figures is very nearly the same as that between the corresponding figures of the tablet.

So it will be with a plate exposed in the camera to a landscape. If the exposure is pushed so that there is a slight veil in the deepest shadows, the darkest visible detail will be far more correctly represented than it otherwise would be.

It is quite true that we cannot push the exposure as we have described, without losing something in the high lights. The detail of the very brightest parts must be somewhat sacrificed, but it would appear that of the two evils, loss of detail in high lights destroys pictorial effect less than loss of detail in the shadow does.

Of course there are exceptions to the rule which we have been, expounding as well as to every other. For example, in those subjects where the effect depends chiefly on the high lights, we may not only have a little clear glass in the negative, but in special cases a good deal. Amongst such subjects, perhaps the most notable are those in which the clouds form a prominent feature in the scene. For such subjects the golden rule may be reversed, and we may say,

"expose for the high lights, and let the shadows take care of themselves."

Another case is that in which there are one or two small spots considerably darker than any of the rest of the subjects. Here it would be inadvisable to expose until the parts of the negative representing these are veiled over.

Still another class of subjects may be noticed, in which it is not advisable to push the exposures till the deepest shadows are slightly veiled. These are portraits in an ordinary room. In all portraits the high lights—the face—are the parts to be chiefly attended to; but in the studio the lighting is so diffused that these will not suffer even when the shadows are very fully exposed. In an ordinary room it is different, however; the shadows here are so deep that if we expose till we get a slight veil in them, the lights are, as a rule, overdone.

GLASS.*

ELEVENTH ARTICLE.

Rolled Plate.—The methods of producing sheet-glass which have recently been described refer exclusively to the ordinary window-glass which is smooth on both its surfaces, and is that which is known as blown glass. The sheets are limited in their dimensions by the ability of the blower to wield the pipe with the weight of "metal" for the formation of a cylinder, and by the possibility of his hands and lungs combining to produce a cylinder of large area during such a period as the material itself will retain heat to remain plastic or workable. Sheets of window-glass, then, average 10, 12, or 14 feet each; extra large sheets will sometimes contain 20 feet, and are sometimes long and narrow, and at other times are almost as broad as they are long; extra sizes can only be produced by the most skilled blowers, are difficult to finish, and are, moreover, expensive.

It will have been seen that the process of making sheet-glass is a somewhat roundabout one; a cylinder has to be formed, then split open and flattened out into a sheet, and then annealed.

If we could just take, say, a ladleful of of glass and pour it out on a smooth surface one would think it should spread out and effect the same thing; but this is scarcely so as a matter of fact, for molten glass is not so fluid as molten lead, nor yet so dough-like that it can be manipulated just as we please. Nevertheless, it can be treated somewhat in this fashion.

Imagine a large furnace within the base of one of the brick-built "cones" familiar to the traveller who passes through Birmingham, St. Helens, or Sunderland; and whether that furnace contains six or eight huge pots, or is a tank furnace, is, for the moment, immaterial. In this furnace is melted the "metal," which, for the purpose of making rolled glass, does not require to be so "fine" as for sheet-glass. Around the furnace runs a narrow line of railway, and on the rails there rests an iron carriage supporting a slab of cast iron some three inches thick, about twelve feet long, and four feet wide. The upper surface of this iron slab has been planed by machinery, and there travels lengthways of this "table" a heavy roller of iron, running upon bearers on either edge; the roller being moved from end to end by means of wheels not unlike the steering wheel of a ship, fixed to its axis, and pulled round by the workmen; parallelism of the roller being maintained by rack-and-pinion, the pinions being on the axis of the roller, and the racks on the edges of the "table." The roller can be made to travel from end to end of the racks, leaving a definite space between the surface of the "table" and the periphery of the roller, which space determines the thickness of the glass.

All being ready for commencing operations, instead of gathering metal on the end of a pipe, there steps up to the furnace a powerful man clad in raiment of a heatproof character, wearing a pair of large leather mittens and armed with a Brobdignagian ladle. He is termed the "ladler," and he at once introduces his ladle into the metal in the pot, lifts the ladle brimfull of molten glass out, rests it an instant on the mouth of the furnace, and then strides towards the "table," and, with a dexterous twist of the ladle, he "plops" the molten glass down just in advance of the roller, which is drawn up at one end. Instantly the roller men seize the wheels and pull the roller the entire length of the table—the plastic "metal" is squeezed before it, being spread out into a sheet whose length and breadth and thickness is determined by the quantity ladled, the gauges to which the roller is set, and the approximate length and width which it has previously been desired to produce. When the roller reaches the farther end of the table the sheet of glass—now cooling to a deep red—is loosened from the table by sliding a thin blade between the sheet and the table, and the table is made to revolve horizontally, so that one end lodges upon a ledge opposite an horizontal slit in the side of the building. If we look into this slit we may see that it is the entrance into a kiln within which lambent flames are lazily circulating. When the sheet of glass has cooled to a very dull red, it is pushed or slid bodily off the table on which it has rolled through the horizontal slit into the kiln, where it reposes a few moments on a perfectly level surface to set; and if we pass through an adjacent door we shall find a couple of men at work with iron rods whose duty it is to slide the sheet along and dexterously raise it up on edge—to pile it—until the kiln is in this way filled with sheets of rolled glass. The process of ladling, rolling, and pushing into the kiln goes on very rapidly—a sheet can be ladled, rolled, and stacked in the kiln in from three to five minutes, and as each sheet contains from 15 to 20 feet, and is practically finished when it is safe in the kiln, there being no further operation necessary, it will thus be seen that the production is much more rapid than in the manufacture of blown glass. Where continuous-tank-furnaces are employed, there is really no necessity for any intermission in the process: as fast as one kiln is filled another is commenced, and so on, so that if the kilns were capacious enough and the tanks would hold together, the process might go on indefinitely; the difficulty is to provide kilns sufficient; hence where pot furnaces are employed, the kilns doing their work of annealing while the next "found" is going on in the pots, by the time the next "found" is ready for rolling the kilns, are ready to be drawn.

The manufacture of rolled plate is an outcome of the process of making cast plate from which polished plate glass is made, but the whole is a much less costly affair, in first cost of plant, &c., and in the manner of working. The entire credit of the invention is due to Mr. James Hartley, of Sunderland, who patented the process, and to this day, although the patent has long ago expired and the glass is made by several other manufacturers, it is known as "Hartley's Patent Rolled Plate." Rolled plate is generally seen of that kind with fine lines on one side; these lines are the impressions given to the molten glass by being rolled upon the "table," whose surface has the fine grooves left by the tool employed in the planing machine. Whatever the condition of the device upon the "table," such will be reproduced on the glass—for instance, tables are made quite smooth, in which case the glass also comes out very smooth, and there are tables planed or grooved with 12 grooves or flutes to the inch, the glass from which is known as "small fluted rolled"—and again there is a "table" grooved with 3½ flutes to the inch, and then the glass is termed "large fluted rolled." Tables are also made upon which glass known as Diamond rolled and Quarry rolled are made, but these latter descriptions have not much employment except for schools and churches.

Rolled glass can be made in substances of ⅛th, 3-16ths,

* Reference to previous articles, vol. xxvi., pages 675 and 737; vol. xxvii., pages 3, 98, 226, 419, and 757; vol. xxviii., pages 338 336, and 626.

¼, and ⅜ths of an inch, and in sheets averaging 20 feet each, which is larger than it is safe to employ in a single pane. The uses for rolled plate are so numerous that it is almost impossible to specify them; but it is per se *the* article for roofing, for side lights, for studios, greenhouses, workshops, and any position where it is desirable to exclude the vision, but not the light. Its remarkable strength, combined with its still more remarkable cheapness, have led to the use of this glass to an extent beyond conception—literally by the acre—for railway stations, markets, mills, &c.

A somewhat modern development of the manufacture of rolled glass has come about in the production of tinted glass called rolled cathedral. This is "metal" of any desired tint rolled upon a "table" whose surface is smooth, and it results, therefore, that both sides of the glass so produced will be tolerably smooth—quite smooth enough for the purpose for which it is employed, viz, in making up into the leaded windows now so much the fashion in houses as well as in churches, where transparency is not desired. The glass for this use is rolled thin, not over one-tenth or one-eighth of an inch, so as to get it easily into the grooved window lead. There is no end to the variety of tints that can be made in rolled cathedral. The so-called "cathedral green," which was some time ago advocated for use in dark-room windows, is simply rolled cathedral of the exact shade of green prescribed.

Excepting that the glass is tinted, and therefore somewhat more expensive to mix, the process is the same as in making rolled plate, and, as has already been stated, it is a much more simple method than that of blowing the same glass into cylinders; hence rolled glass is relatively much cheaper than sheet glass, over which, too, it has the advantage of extra size and substance, obtainable without any disproportionate increase in cost.

Some years ago it was the custom to glaze the roofs of studios with glass of a pale blue tint; that was in the collodion days, and the object sought was, doubtless, to obtain a more actinic light upon the sitter. The subject is not unworthy of re-consideration even in these days of rapid gelatine plates, seeing that we understand the theory of light and its action upon our sensitive surfaces much better than we did twelve years ago.

PHOTOGRAPH OF THE PALL MALL EXHIBITION BY A. L. HENDERSON.

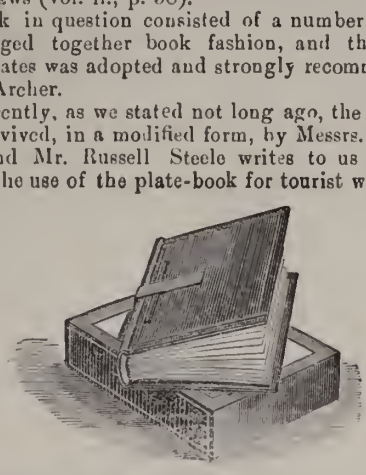
In the number of the Photographic News immediately following the opening of the Exhibition at Pall Mall, we reproduced a photograph of the Exhibition Gallery, taken by Mr. A. L. Henderson, and the photograph in question represented the room in such a state of disorder as one may expect to accompany the hanging of the pictures. When all was arranged and the hanging committee had finished their work, Mr. Henderson secured another negative; an impression from this forming our supplement of this week. Five members of the adjudicating committee, Messrs. Mayall, Mayland, England, Pringle, and Donkin, are shown; also Mr. Warnerke and Mr. Cocking; while many of the principal pictures are recognizable. Borderia's "Rheims Cathedral" is a prominent picture at the top, and a little to the left of Mr. Donkin; while immediately under this is Messrs. G. West and Son's frame of yacht studies. Immediately over the stove pipe, at the top, is Mr. W. P. Marsh's "Giant Breakers at Bognor," and one remove from this, towards the angle where Mr. Mayland is standing, will be seen Mr. Mayall's charming study "Marguerite," a three-quarter figure of a little girl. Almost over "Marguerite," but a little towards the angle already mentioned, will be seen Vanderweyde's portrait of Sir William Siemens, while at the end of the room one may easily recognize Mr. Tagliaferro's large picture of St. John's, Malta, which formed our supplement on Oct. 24th.

PLATE-BOX IN BOOK FORM.

The idea of making a plate-box in the form of a book is by no means a novelty, as an arrangement of this kind was described over a quarter of a century ago in the Photographic News (vol. ii., p. 58).

The book in question consisted of a number of carrier-frames, hinged together book fashion, and this plan of carrying plates was adopted and strongly recommended by Mr. Scott Archer.

Quite recently, as we stated not long ago, the plate-book has been revived, in a modified form, by Messrs. Sands and Hunter, and Mr. Russell Steele writes to us as follows regarding the use of the plate-book for tourist work.



"It is made to hold twelve dry plates, and when the book has been filled, a piece of stout broad elastic, which is attached to the covers of the book, fastens them in their places. The book is then inserted into an outer case, and this outer case into another case, which thoroughly protects the most sensitive films from dust and light.

"The covers of the book and two outer cases are made of stout millboard. Willesden paper, in my opinion, would be better.

"The wood-cut will explain the principle.

"During my summer holiday I made use of six of the books, and found them all that could be desired. The simplicity, ease with which the plates can be packed, and absence about the anxiety of light and dust gaining entrance, will, I feel sure, commend them to amateurs."

PHOTO-ASTRONOMY AT THE RIFFEL.

BY C. RAY WOODS.

No. IV.

In my last, I gave in detail some of the many difficulties I met with, and the attempts I had made to set at rest, one way or another, the objections that had been raised against the process for photographing the corona without an eclipse. I stated that, with reference to the backing, inequalities in the thickness of the asphaltum did produce false effects, but which effects could not for one moment be confounded with the corona-like appearances that Dr. Huggins had obtained in England, and which I have since obtained here. I also described the use of a disc to cut off the sun's image before it fell on the sensitive plate, and how its use removed several difficulties which I had already partially disposed of in other ways. With the introduction of the disc, indeed, most of my troubles may be said to have vanished; but had not a considerable number of experiments been first performed without it, the genuineness of Dr. Huggins' method might not have appeared so clearly as it, to my mind, has appeared. The disc was not tried till an almost complete elimination of error by other methods showed that when everything else had been taken into account, there still remained the great bulk of corona-like appearance round the sun which could not be accounted for by supposing that it could be due to instrumental errors. No alteration of any importance took place when the disc was applied. The form of the corona appeared the same. The only difference was, that my task was rendered so much easier, and I had only to go on

day after day, and get as good and complete a series as I could.

I said in my second article that my most promising results had been obtained on chloride plates. I can supplement this by saying that not only my best results have been obtained by the use of chloride of silver, but the greater portion of the corona photographs were obtained by its means. The plates I used were chiefly commercial ones, prepared for lantern transparencies, the chloride of silver being emulsified in gelatine. Some very good results were obtained on chloride of silver emulsified in collodion, but the difficulties in working them were greater. Each puff of wind raised a little dust about the Observatory, and some of this dust generally managed to settle on the plates before they were dry. Of course it would never have done to have used them whilst still wet, for the irradiation would then have obliterated the corona proper, or at least have confused it. I am not sure but that collodio-chloride is most suitable for the work, when it can be manipulated in a suitable and well situated dark-room; but for work in a temporary observatory, gelatine is best. The plates are already prepared, they only require a dusting-brush to be passed over them, will keep for some time, and are easily controlled in development. My collodio-chloride emulsion, however, was much quicker than the gelatino-chloride plates. I was somewhat surprised at this. It was prepared by the formula given in Captain Abney's book on "Emulsions," and not only contained excess of chloride as shown by the chromate of potash test, but had also been treated with chloride of copper to ensure freedom from fog. Collodio-chloride deserves more attention than it has hitherto received, and would have received, had it not been for the introduction of gelatine. In the days of collodio-bromide most amateurs made their own plates; how many do so now? The wet plate bath is no longer at hand, so that few amateurs use it, therefore, in preparing their lantern slides, and the number who use collodio-bromide is getting smaller and smaller. But since chloride for transparencies is coming into fashion, why not try it in collodion? There is nothing easier to make than a collodio-chloride emulsion, and it will stand the same developers as gelatino-chloride. It is not improbable, moreover, that a similar range of tone may be produced, and there is the additional advantage that it admits of silver intensification with a readiness equal to that of a wet plate.

To return from this little digression to the corona. I have succeeded in obtaining a record extending over two months—two solar revolutions; how far, however, the first month's observations are available remains to be seen. It is certain that the earlier photographs contain a great deal that is not genuine, but, on the other hand, a considerable number of photographs were taken on each day, and these can be made to correct one another. Altogether, about one hundred and fifty negatives have to be examined.

This season has been a very poor one for Switzerland. Something like three thousand visitors less than last year have been in Zermatt, and therefore I calculate I have escaped the stupid questions of one thousand inquisitive individuals. Better still, my own conscience has not been burdened with a corresponding number of untruths. You see, I like to let people have their own way, and if I have been asked whether my instrument was intended for photographing the mountains, I have said, "Yes!" When asked whether I was taking people on the Matterhorn, I said "Yes!" and so on. But when I told one individual that my instrument registered the number of persons, *including mules*, who went up the Gorner Grat, he walked away a little dissatisfied; although he had been trying to strike up a conversation for the past ten minutes, he did not, till then, notice that I was busy, and that he himself had an engagement elsewhere.

It was not till within a week or two before I left that I went up the Gorner Grat myself. To tell the truth, I had been rather frightened at the magnitude of the task when I saw strong, sturdy men being carried up on chairs by porters, or riding up on mules. When I heard, however, that there was no necessity for guides, ropes, and ice-axes, I ordered a carriage and pair, and resolved to do it, or perish in the attempt. The carriage never came, and I had to walk, putting my camera on the shoulders of a porter. The view from the top is magnificent, and my exposures were successful. The most important features in the landscape were the tourists sitting all around, and reading their guide-books for each other's edification; but I contented myself with photographing the minor features of the view, such as Monte Rosa and the Matterhorn. Somehow or other, though, two tourists and three guide-books managed to find their way in.

The badness of the season caused Mr. Seiler to close the hotel sooner than was expected. One morning in the middle of September we found nine inches of snow on the ground, and the feathery flakes were still descending. This was the last straw, and preparations for closing were made. On the 17th the Riffel House was shut, but by that time the weather had changed, and the snow had disappeared. I resolved, therefore, to keep my tent and instrument standing, and took up my quarters at the Riffelalp Hotel till the fine weather broke up. Clear skies lasted for a whole week, and each day I climbed up 1,100 feet to the Observatory. As soon as bad weather set in again, I telegraphed to Zermatt for men and mules, and ere long only a pile of spoiled plates and broken glass were left to mark the spot where my work had been done.

I cannot refrain, here, from raising a tribute of admiration to the business-like capacity of one of the muleteers. Four mules had arrived, and this man said that five were required. I told him to get another one, then. Instead of doing this, however, he put the things on the four mules, and took them to Zermatt, then calmly came and demanded the money for the other mule which I *ought* to have had. What is more, he said that though I paid M. Seiler for the four mules, I must pay *him* for the fifth one, which I had not seen. Unfortunately for him, I had a little business capacity also, and declined to encourage his endeavour to trade on no capital. To do the Swiss people justice, this was the only attempt at extortion I met with during the whole time I was there, and among so many honest fellows it would be strange indeed if one did not meet with one rogue.

Getting my things down was much easier than getting them up, but I had to stay a day or two in Zermatt before I could get everything ready and sent on to Visp. During that time I was able to obtain the services of the Junior Partner, and with his assistance took a few views in the neighbourhood, and packed the plates up for development at home.

I only took one photograph on the journey to Visp, and that was the interior of the church at St. Nicolas. Arrived at Visp, I entrusted my cases of apparatus to the tender mercies of the Railway Company, and took my ticket for Montreux, by the Lake of Geneva, where I had arranged to meet the German artist and two other friends. At Montreux I stayed two days; but must reserve my photographic doings by the Lake of Geneva for an article on "A Day with the Tricycle and Camera in Switzerland," which will conclude my Swiss series.

Twenty-six hours after leaving Montreux I was in London, and soon had the pleasure of developing some good negatives taken in Zermatt and the Rhone Valley.

FORGOTTEN PROCESSES.

BY F. H. CARTER.*

Photography comes to me only as a rare and valued amusement, in which I enter into the result of the labours of others,

* Abstract of a paper read before the Photographic Club.

without in any way contributing to them. It is open, however, to me to think over and to marvel at the progress that photography has made. Men are not now old—in the modern use of the word—who saw its birth as a science; but it had prior to this a long record of forgotten processes. It did not spring full-armed from the head of any inventor, like the block-making machinery at Portsmouth, which is probably unique, as no improvement in it has been found possible since it was first designed.

There were heroes before Agammenon, but they had, we are told, no Homer to record their deeds; so it is possible that others may have seen visions and dreamed dreams before Fabricius, in the early part of the 16th century, seeking the elixir we should all be so glad to find, to confer perpetual youth, threw some sea salt into a solution of nitrate of silver. He noted that the precipitated chloride of silver, which he found white as milk, became black by exposure to the sunlight. He recorded the fact in his "Book of Metals" published in 1536, but did no more. What bearing could such a thing have on the elixir of youth? Scheele, in 1777, re-discovered the fact; and in 1780, Professor Charles, the inventor of the hydrogen gas balloon, turned it to practical use by spreading a solution on paper. He then projected on it a strong beam of sunlight, with the head of one of his pupils interposed, and found that the part exposed became rapidly darkened, and following the outline of the head, the first silhouette was produced—the parent of those fearful and wonderful objects in black paper which are still occasionally to be met with, and were supposed to represent the grandfathers of the present generation.

It is a long leap from Prof. Charles to Isidore Niépce and Daguerre. The former, as an independent worker from 1817 to 1826, and afterwards in partnership with Daguerre, discovered that bitumen of Judea, if spread thin on metal plates, and exposed to sunlight under a print or similar object, became white in the exposed parts, and insoluble in essence of lavender. Subsequently, he etched the bare metal with acid, and named the process heliography. Meanwhile Daguerre had been working out his own idea, still with bitumen; but, by one of those happy accidents—which only genius appropriates—he chanced, it is said, to lay a silver spoon on a metal plate which had been treated with iodine; lifting it afterwards he discovered an image of the spoon on the metal. From that time bitumen was abandoned. Silver plates were exposed to iodine vapours and treated at first with petroleum and afterwards with mercury for a developer; and on the 10th August, 1839, Daguerre demonstrated his process before the Institute of France, and photography became a fact. Paul Delaroche, who was present, is said to have exclaimed, "Painting is dead from today;" but still it lives, and will never be killed by photography, for that deals only with the objective; the imagination in it has no place; it cannot "give to airy nothing a local habitation and a name;" and while poets dream and ideal beauty beckons, the painter will interpret them as best he may. It detracts nothing from the title of Daguerre to a place on the scroll of fame that the Daguerreotype must be classed with forgotten processes. So beautiful were its results, that they will always be regarded with interest, and it is possible that even now curiosity may here and there still cause it to find votaries; but from this begins the era of forgotten processes, for where now are the amphitype and autho-type of Herschel; the calotype of Talbot; the energyatype of Hunt; the coffee process, the tobacco process, the Beechy process, and hosts of others, dear to their discoverers, but to few besides? Where are last winter's snows?

But the world owes a large debt of gratitude to men like Robert Hunt, who gave time, and thought, and money, to the advance of this beautiful art. A few names stand out with especial prominence. Claudet, who in 1841 discovered the use of bromine as an accelerator for Daguerreotype plates, and made portraiture possible; Talbot, who invented the Calotype process; Herschel the astronomer, who discovered the use of hypo-sulphite of soda as a fixing agent; and, greatest of all in results, Scott Archer, who in 1851, with the generosity of a noble mind, gave to the world, free and unfettered, the collodion process; and although this, too, has been superseded by the gelatine process, the subjugation has not been complete: the two Richmonds remain in the field, and if the former is vanquished, it still retires with strife. And now what shall be said of the future? Has perfection been attained, or are there still worlds to conquer? If we look at the work of the masters of the art, some of whom are present, and whose blushes I will spare by not naming them, we might think the last page was written, and that nothing more remained to be done. But it is those whose work is the best who see room for improvement, and who still go on and strive for perfection yet unobtained. Still remains the dream of photographing in colours, more a wish than an expectation. But the constantly-advancing uses of photography are no dream. The Woodburytype process enables portraits to be multiplied to any extent without fear of fading. The photogravure of Goupil makes collectors of engravings despair; for the various "states" of a plate can be so exactly reproduced that no specimen can now be looked upon as unique if it has been in their possession. And its latest application, stellar photography, is perhaps to some the most interesting of all. The mind reels in contemplating the awful depths of space where worlds in myriads spangle the darkness like golden sands, or nebulæ in fantastic forms, the raw material of unformed systems, perplex the astronomer.

Photography is finding its way into book illustration, and it may be that, before many years are past, wood engraving may be driven from the field by its newest rival, which is ever seeking new worlds to conquer, and become a forgotten process. If, as it says in "Locksley Hall,"

> "Science moves but slowly, slowly,
> Creeping on from point to point,"

so far as photography is concerned, it makes good its advances, and these are due in no slight degree to the forgotten processes to which reference has been made.

HOW TO PHOTOGRAPH MICROSCOPIC OBJECTS.

BY I. H. JENNINGS.

Lesson IX.—Preparing Entomological Slides.

A glance at the catalogues of the professional preparers will show how popular are insect preparations. Nor is this surprising. The marvellous beauty of form, the gorgeous colours, the elaborate workmanship displayed in the construction of their various organs, together with the minute size of many of the insect tribe, all render them fit objects for microscopic study. Many of their beauties are apparent to the unaided eye, but under the microscope they are increased tenfold; while others alone reveal themselves to the scrutiny of the magic tube. But for it, the delicate mosaic of the butterfly's wing, the mysteries of the gem spangled elytra of the diamond beetle, the myriad-facetted eye common to the whole insect world, and all the wonders of their internal structure, would remain hidden to us.

As insects vary so much in size, colours, and texture, the modes of preparing them for photography must also vary to suit the subject under treatment.

1. *Opaque Mounting.*—This method is alone available in some cases, as the application of balsam or any medium would not only diminish the beauty of the specimen, but often prove destructive in effect. Such objects as scales, such as those of butterflies, the Podura and Lepisma, as well as some wings which are very transparent, as well as small insects like the Tingis and Thrips, which can be successfully photographed by reflected light, should be mounted dry. In the case of small flat objects, as scales, no cell will be required; all that is necessary is to place the scale in position on the slide, and cement a thin cover over it. Larger objects will require a cell, which, for photography, had better be of glass. Glass cells are sold at a cheap rate, look well, and have the advantage of allowing light to pass through their sides, which is often desirable. They can easily be manufactured at home by anyone who has a little skill, by cutting rings from glass tubing with a sharp flat file. Various cements may be used for attaching the cell to the glass slip; marine glue is the most trustworthy, but is somewhat difficult to manage, as it requires a strong heat to melt it. Gold-size, when good, is equally reliable, but the various cements which have been used of late years for mending broken china and glass, such as coaguline, appear to be quite satisfactory, and, being colourless, look best when used with glass cells.

2. *Mounting in Balsam.*—Whole insects are usually prepared and mounted in the following way:—Having

killed the insect, either by means of the cyanide bottle, or by immersion in spirits, it is set out carefully between two glass slides, which are tied together and put in a strong solution of potash—caustic potash one ounce, water twenty ounces. Here it must remain for some time, according to its colour and texture; but a frequent examination of the specimen is necessary, as some insects dissolve into a jelly if kept in potash too long. One or two days will suffice for most specimens, but others will take longer. When it becomes sufficiently soft, it is taken out of the potash, placed in a saucer of pure water, and gently pressed with a soft brush until the contents of the thorax and abdomen are expelled. It must then be washed with fresh water until quite clean, when it must again be set out on a slide in the position which it is finally to occupy, covered with a square of thin glass, and tied down with thread. Here the treatment may vary. The older method was to keep the slide in a warm place, under cover, until the preparation became quite dry, and then immerse it in turpentine.

The objection to this plan was that the insect became full of air, which it is almost impossible to expel, unless by the aid of an air-pump. The better method is, to drain all the water from the insect after washing, using blotting paper if necessary, and then immerse it in alcohol and water for about a day, and after that in pure methylated spirit to displace all the water. A second dose of pure spirit may be necessary in some cases. The whole of the water will thus be removed by the spirit, which will also render the preparation so firm that, on the application of the balsam, it will not alter from the position in which it was set. When quite free from moisture a few days' soaking in turpentine will give most specimens the necessary transparency. Some insects and parts of insects may, however, require to be left in turpentine for several weeks before they are fit to mount.

The tissues of some dark-coloured insects are best treated with some bleaching agent immediately after their removal from the potash solution; one of the best is as follows:—

Hydrochloric acid	10 or 12 drops
Chlorate of potash... ...	½ drachm
Water	1 ounce

This will remove the objectionable strong browns and yellows of the chitinous portions, which are so fatal to obtaining a good photograph. By examining the object occasionally, the right amount of transparency will be gained, but it is best not to let preparations remain too long in the bleaching solution, because if too transparent they will be as difficult to photograph as if too opaque. The writer recently photographed two splendid fly's tongues, or ligulæ, specially prepared by Topping. These were selected out of seventy-two similar preparations, but while both were perfection as microscopic objects, or for exhibition in the lantern microscope, only one was fit for photography. The other had been bleached too much, and was too thin to give a satisfactory photograph.

When the necessary transparency has been attained, and after the object has been successively treated with alcohol and turpentine, it is ready for mounting. A solution of balsam in benzol is better than pure balsam in many ways. The solution may be prepared by "baking" pure balsam in a slow oven until it becomes quite hard on cooling, and then dissolving in benzol, or may be purchased at the shop of any optician. The insect, or part of one, is removed from the turpentine and drained, placed in position on a slide, a cover-glass placed over it, and a small quantity of the balsam solution applied to the side, when it will be drawn under by capillary attraction. By a little care, air-bubbles may be entirely avoided. The slide is then put aside until the balsam has become quite hard, when it may be cleaned for the cabinet, and ornamented with rings of coloured varnish, as the mounter's taste may dictate.

Of late years many microscopists have objected to the "squashing" process usually employed in mounting insects, as, in many cases, it deforms and distorts the preparation almost beyond recognition; and now many amateur and professional preparers mount insects without pressure, first gaining the necessary transparency by prolonged immersion in turpentine, and finally mounting with balsam in a cell. Objects thus mounted are very beautiful, especially when illuminated with the paraboloid or spot-lens, but are somewhat difficult subjects for photography, unless a very low power, such as a five-inch, four-inch, or three-inch be employed, as great penetration is required.

It is best, when engaged in mounting insects specially for photography, not to mount indiscriminately any pretty object, but to set up a type-series, to illustrate the class *Insecta*, which, when photographed, would have a real scientific value. Something after the following style might be attempted:—

1. *Coleoptera.*—Many of the smaller species can be set up whole, after bleaching in the chlorate of potash mixture. A few feet may also be mounted; the paddle-foot of *Dytiscus*, the broad-padded foot of *Timarchus*, and the type-foot of *Carabus*. Some of the antennæ, as those of *Melolontha*, are also well worth mounting and photographing.

2. *Dermaptera* (the earwigs).—A specimen may be mounted whole for a five-inch objective: if possible, with the wings expanded. This subject will not require more than a few hours' treatment with potash.

3. *Orthoptera* (the cockroach).—*Blatta Orientalis* is a good type, although not a true English insect. Almost colourless specimens may be found in kitchens which these creatures haunt. These will require no preliminary bleaching.

4. *Thysanoptera.*—The diminutive insects so abundant and so troublesome in hot summers—insects which will persist in crawling over one's face, and into one's mouth and eyes, which swarm everywhere and on everything—constitute this order. One of the largest, *Phlæothrips coriacea*, measuring about $\frac{1}{4}$ of an inch in length, may be set up whole in balsam.

5. *Neuroptera.*—A portion of the large facetted eye of the dragon-fly may be mounted flat on a slide in balsam, and will form a very instructive photograph.

6. *Trichoptera.*—The larva of the caddis fly may easily be prepared. The internal parts must be removed, when, after washing and treatment with turpentine, it is ready for mounting. The mature caddis-fly may be set up whole.

7. *Hymenoptera* (bees and wasps).—The wings, showing attaching hooklets, may be mounted dry or in balsam. The feet will require to be bleached strongly, as most of the *Hymenoptera* are strongly coloured. The modified ovipositor, called a "sting," should be cut from the insect carefully, so as to have the poison-bag attached. The stings—for there are two—lie enveloped in a case of brown chitine, from which they may be dislodged with a fine needle. The poison-bag, owing to its extreme transparency, must be stained—not with *blue*, as in many professional preparations, but with brown. Bismarck brown is, perhaps, as good as any. Sufficient stain should be used to give this part as nearly as possible the same colour as the stings.

The saw-flies show another modification of—or, rather, addition to—the real ovipositor. This consists of a sawing apparatus, composed of four saws—two small and two large ones, the former fitting into the latter. This object is rather difficult to photograph when set up in balsam, as it becomes too transparent. A well-mounted *dry* specimen will give more satisfaction.

8. *Lepidoptera* (or butterflies) are interesting from their finely-marked scales, which form tests for low powers. They should be mounted dry.

9. *Homoptera* (frog-hoppers and *aphides*).—The former

possess saws, which may be prepared like those of the saw-flies.

10. *Heteroptera* (or bugs).—The "beak" of *Cimex lectularius* and the oar-foot of the water-boatman may be mounted in balsam.

11. *Aphaniptera* (or fleas).—The insects, to be successfully mounted, require a severe treatment with potash, and a long soaking in turpentine. Preliminary bleaching in the hydrochloric acid mixture is, perhaps, best to get rid of the yellow colour, which renders them difficult to photograph satisfactorily.

12. *Diptera* (or flies).—The feet of the dark-coloured species will require bleaching with chlorate of potash. The "tongues," or *ligulæ*, should also be bleached, but *not too much*. The proper way to mount a fly's tongue is to set it up in a shallow cell, *without pressure*. The specimens usually sold, being mounted flat, are distorted, and give an improper idea of the real shape of the organ.

For further information as to dissection, &c., the student is referred to "Practical Microscopy," by Mr. G. E. Davis.

DR. JANEWAY'S TABLE OF THE SOLUBILITY OF PHOTOGRAPHIC CHEMICALS.

Made for the Society of Amateur Photographers of New York.

Abbreviations.—s. soluble; ins. insoluble; sp. sparingly; m. moderately; v. very; alm. almost; dec. decomposed.

CHEMICALS.	Water. 59° F.	Water. 212° F.	Cold Alcohol.
One part is soluble in	Parts.	Parts.	Parts.
Acid, Citric	0·75	·6	v. s.
Gallic	100	3	m. s.
Oxalic	8	1	v. s.
Pyrogallic	3 5	v. s.	v. s.
Tannic	6	v. s.	v. s.
Alum	10·5	v. s.	ins.
Chrome	10	dec.	ins.
Ammonium, Nitrate	0·5	v. s.	v. s.
Chloride	3	v. s.	sp. s.
Carbonate	4	dec.	m. s.
Sulphocyanate	v. s.	v. s.	v. s.
Bromide	1 5	0·7	sp. s.
Iodide	1	0 5	m. s.
Baryta, Nitrate	8	3	
Cadmium, Bromide	v. s.	v. s.	m. s.
Iodide	v. s.	v. s.	v. s.
Copper, Acetate	15	3	sp. s.
Sulphate	2·6	0·5	ins.
Gold, Chloride	v. s.	v. s.	v. s.
Gold and Sodium Chloride	v. s.	v. s.	m. s.
Iron, Perchloride	v. s.	v. s.	v. s.
Protosulphate	1·8	0 3	ins.
and Ammonia sulphate	3	0·8	ins.
Iodide (Ferrous)	v. s.	v. s.	sp. s.
Iodine	7000		m. s.
Kaolin	ins.	ins.	ins.
Lead, Acetate	1·8	0·5	m. s.
Chloride	v. sp.	33	ins.
Nitrate	2	0·8	ins.
Lithium, Bromide	v. s.	v. s.	m. s.
Iodide	v. s.	v. s.	m. s.
Magnesia, Nitrate	v. s.	v. s.	m. s.
Mercury, Bichloride	16	2	v. s.
Cyanide	12·8	3	ins.
Potassium, Acetate	0·4	v. s.	v. s.

CHEMICALS.	Water. 59° F.	Water. 212° F.	Cold Alcohol.
One part is soluble in	Parts.	Parts.	
Potassium, Bicarbonate	3·2	dec.	ins.
Bichromate	10	1 5	ins.
Bromide	1·6	1	sp. s.
Carbonate	1	0 7	ins.
Cyanide	2	1	m. s.
Ferricyanide	3·8	2	ins.
Ferrocyanide	4	2	ins.
Nitrate	4	0·4	ins.
Iodide	0·8	0 5	m. s.
Oxalate	5	v. s.	ins.
Permanganate	20	3	ins.
Sulphate	9	4	ins.
Sulphite	4	5	sp. s.
Sulphuret	2	1	sp. s.
Silver, Nitrate	0·8	0·4	m. s.
Oxide	v. sp. s.	v. sp. s	ins.
Sodium, Acetate	3	1	m. s.
Bromide	1·2	0 5	m. s.
Bicarbonate	12	dec.	ins.
Carbonate	1 6	0·25	ins.
Citrate	v. s.	v. s.	sp. s.
Hyposulphite	1	v. s'	ins.
Iodide	0·6	0·3	m. s.
Nitrate	1·3	0·6	sp. s.
Phosphate	6	2	ins.
Pyrophosphate	12	1·1	ins.
Sulphite	4	0 9	sp. s.
Sulphate	2·8	0·4	ins.
Tungstate	4·0	2 0	ins.
Strontia, Chloride	1·88	v. s.	sp. s.
Uranium, Nitrate	v. s.	v. s.	m. s.
Zinc, Iodide	v. s.	v. s.	m. s.
Bromide	v. s.	v. s.	m. s.
Chloride	0 33	v. s.	v. s.

Reviews.

The Dynamo; How Made and How Used. By S. R. Bottone. (*London: Swan, Sonnenschein, and Co.*)

This is just one of those handy little works which not only the student, amateur electrician, or photographer, may read and study with advantage, but which the general public ought to know something about. It is perfectly astounding to find the great amount of ignorance which prevails among unscientific people upon matters electrical, and still more extraordinary is the positively erroneous notion, which perhaps nine people out of ten have, as to how electricity is produced by means of the dynamo machine. One has but to overhear the conversation in a railway carriage, or even at the table of an hotel, if perchance the subject turns upon electric lighting, and be compelled to listen to authoritative statements made with the utmost coolness, which are all wrong both in theory and practice, when one wishes the speakers could have read some such work as Mr. Bottone's. Mr. Bottone is not only an electrician, but is an authority on most photographic subjects, and what he writes can be depended upon as being sound. His book under review forms no exception to this. Within some seventy odd pages he has explained very clearly the principles upon which dynamo machines are constructed, and by the aid of drawings has shown how the amateur mechanic of ordinary ability may construct a hand machine capable of lighting four 5-candle power incandescent lamps, as well as performing many experiments which, if a battery had to be set up, would simply remain untried. Mr. Bottone says: "When the machine is doing its best work—that is to say, when the resistance of the interpolar is equal to the internal resistance of the machine—the current is equal to that of eight or ten Bunsen's cells against an equal resistance." That is a very good result.

For further information, we advise our readers to peruse the book.

Notes.

The bacterium, in his somewhat Proteus like aspects, is attracting much attention just now; and the more we can learn about him, or the more widely his portrait can be circulated, so much the better is it for the world in general. Just as sitters were photographed with whitened faces in the early days of the Daguerreotype, the bacterium must be stained before his portrait is taken. Apart from such difficulties as arise from the extreme transparency of minute organisms, it frequently happens that it is only by staining them that their structural details are brought out.

In a lecture given at King's College on Monday last, Mr. Thurston told his audience how to prepare and pose the bacterium, and he is good enough to furnish us with an article on the subject (page 779).

A correspondent writes:—"Would it be considered derogatory to the Photographic Society of Great Britain if an intimation were placed in the catalogue that copies of the pictures exhibited could be purchased by communicating with the artists? At exhibitions of paintings, from the Royal Academy downwards, the pictures are apparently shown for the purpose of being sold; but at photographic exhibitions all mention of buying and selling is carefully kept out of sight. I know several visitors who would have been very glad to have purchased copies of some of the pictures exhibited at the recent exhibition, but they did not know how to set about it. Perhaps it may be said that common sense would have suggested writing to the artist, whose address would be found in the catalogue; but everybody who has had anything to do with the public as a body, knows that it has not common sense, that it will not take any trouble, and that everything has to be made as plain to it as though it were a child. Is not this a matter worth considering by the Council?"

A lantern slide club! Mr. Henry Smith thinks that amateur lanternists should unite and form a club; a lending library of slides being the main feature of Mr. Smith's idea. His letter will be found on page 782, and we certainly hope the club will be formed. Why not as a branch of the Photographic Club?

It is curious, considering the thousand and one purposes to which photography has been turned, that no one has ever thought of adapting it as regards portraiture to Christmas cards. Photographs on Christmas cards are of course no novelties, but to send one's portrait surrounded by a tasteful border, and accompanied by an appropriate sentiment, has not yet been done. It no doubt requires somebody to set the fashion, and somebody else to design the cards and place them in the market. The sitting for one's portrait, especially when the head and shoulders alone are wanted, is, if people did but know it, a very small matter now-a-days.

On these latter points, by the way, the public need much enlightenment. Nine persons out of ten had the experience of fifteen years ago or so before their eyes, when photographers were not so skilful, artistic, or systematic as they are now. The head-rest was a source of tribulation, the slowness of the collodion plate and consequent risk of failure produced continual woe. The great majority of the public do not know that all this is changed. If everybody, men of business especially, were made aware that the loss of time once almost inseparable from a visit to a photographic studio is reduced now to a minimum, sitters would certainly increase in number.

A Mendoza camera hat was wanted at the magisterial examination of the man charged with committing the murder at Torquay. An artist detected sketching the prisoner was stopped by the magistrate, who, however, graciously gave him permission to take the portrait of anybody else he liked.

No doubt the artist got as much as he wanted before he was detected. Anyway, he was more fortunate than a friend of ours, who was sent to get the portraits of a miscreant whose wholesale murders at Uxbridge made a great sensation some twelve years ago. The artist who wanted the portrait for the current number of an illustrated paper could not wait for the examination, as it was with him a question of hours. His persuasive powers, however, were fruitless, for none of the officials of the prison, from the governor downwards, would let him have a sight of the prisoner. He was in despair, when meeting a friendly detective engaged in the case, the latter said, "Why, So-and-So," naming a small tradesman in the town, "is the very image of the prisoner." This was enough for the artist. Off they started for the shop, and while the detective engaged the proprietor in conversation, the artist got his features in his note-book. Two days after, the paper came out with a portrait of the murderer, "sketched from life"—a statement which, after all, was literally correct.

We have heard of two things lately which are hard to believe, but which may be true for all that. One is, that a Greenwich photographer possessed a large stock of plates which would frill in spite of every effort, until he adopted the simple method of heating his developer to a temperature of about 150° F. The other is a statement that a well-known photographer residing in Greenwich put up a prominent notice as follows:—"To-day being the anniversary of the decease of my mother-in-law, I will make all pictures at half rates." The two individuals referred to are not fellow-townsmen, as the first mentioned Greenwich is in Kent, and the second is in the United States.

That the pupils of eye expands to a definite extent under the influence of a constant light, is a principle which Mr. Gorham has satisfied himself to be true; and the outcome is the pupil-photometer, which was recently exhibited at a meeting of the Royal Society. Gorham's instrument is, in fact, a means of measuring the pupil. One merely looks in it, revolves the lid until the two images of the pupil presented to the eye just touch each other, and the diameter of the observer's pupil can be at once read off in hundredths of an inch.

We shall shortly give a fuller description of the instrument.

The wet plate tourist photographer has one advantage over the dry plate worker, as the former can make friends by taking and delivering pictures on the spot—ferrotypes, or positives on glass.

Dr. H. W. Vogel, in calling attention to this circumstance, suggests the desirability of making dry plates which

will serve for the production of direct positives. Ferrotype plates, or glass coated with a thin emulsion, should answer, but Dr. Vogel points out that a substratum would be required to enable them to stand rough and ready development under trying circumstances.

So decided has been the success of the Dublin Exhibition, that it will be kept open until Christmas. Over three thousand persons have already visited it.

Mr. Beach, of New York, suggests that metal frames or rims, for binding together the two glasses which constitute an ordinary lantern slide, should be introduced into commerce. They could be made of very thin sheet brass, something like the "binders" used for positives on glass.

The path of a comet can be better recorded by the camera than in any other way, according to Mr. A. Belopolski; but very good instruments are required, as long exposures are unavoidable.

Belopolski made a series of investigations in order to ascertain what lens would give him the best definition and the maximum of light, and of those he tried, the very best was a small portrait lens of English manufacture, this instrument proving first both as to speed and definition.

The lenses were tested by exposure on the Milky Way in Cygnus; the exposure being one hour, and the plates used showed a sensitiveness of 22 by Warnerke's sensitometer. Although the portrait lens was used without a diaphragm, it defined stars up to the ninth magnitude, and defined them so well that good measurements could be made on the plate; the actual diameter of the image of a ninth magnitude star being 0·036 of a millimetre, or considerably less than a six-hundredth of an inch.

French and German portrait lenses which were tried, did not compare well with that of English make, the star images being surrounded with a halo, and in one case with two concentric rings.

A correspondent of the New York *Photographic Times* says that he had some of Vogel's azaline plates sent to him to try, but they would fit none of the American plate-holders or "kits," so a new "kit" had to be made for them before they could be tested. Would it not have been simpler to cut down the plates, some of which were as large as 9½ by 7 inches, to the nearest smaller American size?

A correspondent who, evidently, forgets that the silly season has come to an end, writes to inform us that, encouraged by the success of Mr. Mendoza's hat-camera, he is now engaged in perfecting arrangements which, when complete, will, he hopes, enable him to present to the world yet another novelty in photographic apparatus in the shape of a pipe! The lens will be fitted into the side of a largest sized meerschaum bowl, so carved as to conceal its presence; whilst within this bowl (which will be rather large, he admits, for out-door use) will be a tiny camera. The arrangements for focussing, &c., are to be regulated by thin wires passing down the stem, and capable of being managed after practice by the teeth of the operator. All the possessor of one of these new pipe cameras will have to do will be to place the pipe between his lips, and of course point the lens at the object he wishes to take. "The rest," he adds, "will be simplicity itself." Quite so, including the credulous individuals who believe in this photographic fig, or rather little gooseberry.

Photographic business does not seem to be very brisk in the Russian capital just now, and rumour asserts that no less than eighteen photographers have permanently closed their establishments since the summer. One enterprising individual on the *Nevski* has issued a circular with the view of obtaining yearly subscribers, who pay down a sum of about £3, which entitles them to be photographed on six different occasions during the year, and to receive a dozen cabinets each time. As the subscriber may transfer his right to be photographed, the arrangement is much patronised by families; but when two sitters are to be taken on the same plate, there is an extra charge.

A correspondent who has lately returned from a sketching tour in the Highlands, says that he was gratified to see so many artists making use of the camera. He says: "I passed the last six weeks along with two R.A. associates, and we were often surprised to see the camera in the hands of well-known artists; indeed we found no less a person than Birket Foster's son using one; Birket was himself working not far from us on Loch Lomond side. But the curious thing was that we had not seen any but English artists with the camera; although, of course, we know that many Scottish artists of reputation appreciate its value."

The ferrotype studio which is under the shade of the Drachenfels has been wrecked by a falling fragment of rock. Fortunately, no one was injured.

Like our own Queen, the Sultan is a patron of the photographer; and he has recently given orders for the making of a monster album in which a portrait of every servant of the Court, from the highest to the lowest, is to be included. The Turks seem to have quite overcome those religious scruples which once made it difficult to persuade a follower of the true prophet to have his portrait taken.

Patent Intelligence.

Applications for Letters Patent.

15,542. Alfred Julius Boult, 323, High Holborn, Middlesex, for "Improvements in or relating to holders for photographic films."—Communicated by George Eastman and William Hall Walker, United States.—Dated 25th November, 1884.

15,757. Herbert John Haddon, 67, Strand, Westminster, for Improvement in heliographic copying apparatus."—Commu-

nicated by Hugo Sack, Plagwitz-Leipzig.—Dated 29th Nov., 1884.

Patent Sealed.

11,556. Eugen Himly, 28, Southampton Buildings, Chancery Lane, W.C., for "Improved method of, and apparatus for, taking photographs by artificial light."—Dated 22nd August, 1884.

Specification published during the week.

1380. R. Brown, R. W. Barnes, and J. Bell, "Preparation of pictures and photographs."

This embodies the additions and alterations referred to on p. 219 of our present volume.

1622. Alexander Crawford Lamb, of Reform Street, Dundee, in the County of Forfar, Hotel Proprietor, for "Improvements in Photographic Cameras." Dated 17th January, 1884.

The object of this invention is to enable photographic cameras to be carried conveniently in the pocket, while being readily opened up and adapted for use at any time.

The invention consists in connecting the front part of the camera, in which is fitted the lens, and the back part or frame which carries the dark slide, by means of springs or spring bars which admit of the front and back parts being brought close together to close the camera, or opened out and rigidly held when it is to be used.

According to one modification of the invention, the front and back frames of the camera are connected together by four jointed spring stays or bars similar to those used in collapsible opera hats, and fitted at each corner. Each spring stay is made in two lengths or bars and jointed in the middle, so that it can fold inwards to close the camera. Between the parts of the stay bar a bearing shoulder is formed, and the bars are held in their distended position by means of helical or other springs which are attached to hooks or catches formed on the bars. When fully distended, the two parts of each bar bear on each other at mid length, and form a rigid stay. The stays thus formed at each corner suffice to hold out the camera in its open position. The usual bellows or dark cloth is connected to the end pieces to form the box-like body of the camera.

HINTS ON POSING AND THE MANAGEMENT OF THE SITTER.

BY H. P. ROBINSON.

Chapter VIII.—Children.

There was a time when children were looked upon with dread by the photographer, and I knew two or three studios where they were absolutely refused. This was in the days when sitters were as plentiful as blackberries in autumn, and professional pleasure in overcoming difficulties was quite subsidiary to the number of guineas taken.

The true photographer will always take delight in a difficult sitter, just as a surgeon does in a beautiful case of compound fracture, or a physician in some obscure disease. To go on exposing a long succession of plates on easy subjects soon becomes monotonous; it is when a sitter calls for your reserve powers that he becomes interesting. There are certainly some bad sitters who are very depressing, with no redeeming points about them, such as those who begin by saying they hate being taken, following this pleasant observation up with the worn-out old joke about it being as bad as going to the dentist. It is a very curious thing how they all bring this ancient pleasantry out as if it was perfectly original, and a fine sample of wit. It is not very exciting amusement to work this sort of customer round into a happy frame of mind; but there is to me something almost fascinating about a fractious three-year-old who objects to have his portrait taken.

In a case of this kind it is your duty to so work upon that child that he shall not only willingly do all you require, but shall be so delighted with you that he shall howl when he is taken away after the operation, and will only be pacified by a promise that he shall come again.

"How is this to be done?" may well be asked. There are two things of primary importance. The child must not be forced, and mothers and nurses must be rigidly suppressed. When I have had a few minutes' interview with a child, I easily discover if it has been worried, and spoilt for my purpose, by some bungling photographer who has so frightened it that it dreads to enter a studio; or if it has been—shall I say tampered with?—by the mother or nurse. These latter will think they are doing the right thing when they solemnly impress upon the little sitters that they must be very good and keep quite still; but their well-intentioned warnings produce exactly the reverse effect to what is wanted. The child that insists upon being good is an unmitigated nuisance. He will do everything you ask him to do, and looks as wooden as an awkward lay figure.

With the great majority of children the battle is won or lost at the first introduction. The clever photographer will decide at a glance whether the child belongs to one of these classes—the fearless child who takes the sitting as part of the day's occupation and enjoys it; the nervous child who really would be good, but has a constitutional fear of any new experience; and, worst of all, the shy child. The first of these is easily managed; the chief thing to bear in mind is that the first of him will be the best, and that the sooner you take him the better. As he gets to know you better—familiarity breeds contempt—he will become less manageable. He will continue to smile and be very good and agreeable, but you will find that after a few exposures he will quietly slip off the chair, or run away from where you have placed him when you turn to go to the camera. He approves of you, and wants to have a lark with you. But when very young children begin to play practical jokes, I know no cure for the disease except sending them home to meditate on their sins, to come again another day if the exposures you have already made do not produce satisfactory pictures.

The nervous child wants very gentle management. It is no use attempting to proceed at once to serious business in a case of this kind. The subject must be led up to gradually. The photographer had better meet her—it is usually a girl—in the reception room, and quietly introduce himself. This leads to showing and getting interested in pictures, when the nervousness will probably begin to wear off. In my studio I have an intermediate room between the reception-room and the studio proper. The place is full of things interesting to children, and I find it very useful in gradually breaking the nervous little patient in, before my horrid purpose is fully divulged. If, after a few minutes' talk and looking at pictures, you should happen to have a squeaking toy or a musical box in your pocket, and you begin a gentle performance on it, you will have nearly got that child into a proper state of mind for a sitting, or, at all events, for going through the needful arrangements in the dressing-room. At first the child should not be allowed to see the toy; it should be an invisible performance, something for the mind of the patient to dwell on and wonder at during the dressing operation. By this time, if you have not mismanaged, you will have so "corralled the sympathies" of the child that she will have lost much of her fear of you; and if you will allow her nurse to keep close to her, she will allow you to jump her up on a table, and even, if you not bungle or hurry it, place the head-rest. When nervous children get over the first exposure and find it does not hurt them, they usually become very good sitters. But there are children whose nervousness it is almost impossible to get over. These have either suffered from a medical operation, or from the dentist, or, worst of all, they have had a bad quarter of an hour with a bungling or brutal photographer who had no patience or care for the management of children, and had to try to do by force what ought to have been done by guile. Photographers should recognise the fact that their principal weapon with children is 'wheedling," although there are, I admit, some cases in which a moderate degree of firmness is useful.

The shy child is extremely difficult to manage. She is not afraid of you, but simply shy, and endeavours to get behind her mother or nurse, and hide herself in her dress. In these cases it is often better not to try much persuasion, except perhaps a gentle attempt to make friends, but to proceed to the studio and go on with the sitting at once. A shy child will often take the sitting as a matter of course if it is done quickly, but would become troublesome if allowed time to think.

In all these classes there are, of course, all degrees and varieties, but I can only write generally on the treatment of the class; the photographer must modify his entertainment to suit individual cases; but if he is kind, quiet, patient, and judicious, he will not lose above one or two per cent. of the children brought to him for their portraits.

It is curious to observe the different idiosyncracies of children. The photographer will find it useful to classify them as I have done above; but there are many species in each genus. Notice the different ways they have of objecting to be photographed. Some object right out, and fight and scream against it. This is mere brute-force opposition, without any subtlety in it; but some children, you would almost think, had studied resistance as a fine art.

If a child fights, it is of no use to oppose force by force. Nurses will often attempt this, but you must stop them at once. The child must be a willing victim, or it must be sent away to come again another day. When a child will not sit, try to find out the cause. Analyse the subject as you would a problem in mathematics. Probably the mother is in the room; now mothers are a very useful institution, but they are terribly in the way when their children are to be photographed. Turn her out with all the civility you can command. You must then ask the nurse to do everything you direct intelligently and quickly, but on no account to help when not asked, as she may be doing something exactly opposite to what you required. The ground will now be cleared for dealing with your sitter; the time he has had to himself will have probably altered his convictions, and he will submit; if not, shake hands with him, and wish him good-bye, as you only want good children to play with. If this and other blandishments do not fetch him, let him go. The visit has done him no harm, and he will remember things that he would like to see again, and on a second visit will probably sit without any trouble.

It would be tedious to consider separately every variation in the characters of children, but if the photographer would succeed with these delightful little troubles, he must have great patience, a genuine delight in a difficult subject, and a strong determination to succeed with it. Above all, he must establish perfect confidence between himself and his sitter, to do which he must descend to the level of the child, and, remembering that little things please little minds, be able to enter into childish games, tell childish tales, and, above all, to play with toys!

Before concluding this subject, I must say a word or two on expression. The most beautiful thing about the most beautiful child is nearly always its expression. This can only be educed by stratagem, and should demand the greatest efforts of the photographer. A simple pose, such as sitting on a table (which, for a three-quarter vignette, is a very suitable position), will suit a child better than any elaborate arrangement, so that your attention shall not be unduly distracted from the bringing out of the best expression.

You will of course have a whole battery of toys ready when required to amuse your little sitters, for toys are the stock-in-trade of childhood, and he who understands their use and mystery best will soonest become at one with his subject. I should strongly recommend you to keep them strictly for your own use. If the child sees they belong to you, and can only be got through you, you will become a much more interesting person to him, and consequently have more power. If you allow the nurse to have the run of the collection, she will show them all at once, or quickly one after the other, and their power for use will be gone. Some toys are more adapted to keep children quiet, or awaken their expression, than others—those to which they have to listen, for instance. The ticking of a watch is the most familiar of these, but it must be a loud-ticking one, or the effort to hear will put too much strain into the expression. A musical box is good, but rather too elaborate; any toy that is new to the child is good, but those that have something comic about them, and make a noise, are best. I have found some of the india-rubber toys that squeak, when pressed, very effective.

There are some children who will sit as you place them without any trouble, but when you are thinking what an easy job you have got, and put your hand on the cap of the lens, you find them making faces. This generally takes the form of an awe-struck opening of the mouth. This is a case difficult to treat. You will not be so unwise as to tell it to close its lips, for to mention any feature to a child is to make it think of that feature, and proceed to contort it at once. Perhaps, if you have not warned her, the injudicious nurse tells it to shut its mouth, and the good, obedient little thing will at once close it so firmly that there is nothing more to be done until the child has forgotten it. I have found that the best way to deal with a case of this kind is simply to touch the child on the lower lip, and the mouth will assume its natural position.

I have made this chapter on posing children already too long without saying anything about posing them, making it something like Artemus Ward's lecture on Africa, in which the subject was not referred to except in the advertisements. The fact is, there can be very little posing of a young child: you must do, not what you would, but what the child will allow. There is one thing open to you—you may so arrange your furniture and accessories that the child shall ultimately take a good pose. I have already spoken of placing it on a table; this, with a rug and blocks of wood, will afford plenty of variety, and for older children a moveable platform may be provided, with perhaps a few rocks; for it does not do to look down too much on your subject—and working at a low camera is not conducive to comfort.

THE STAINING OF BACTERIA FOR MICRO-PHOTOGRAPHIC PURPOSES.

BY EDGAR THURSTON,

Curator of the Anatomical Museum, King's College, London.

By means of micro-photography, very faithful representations of the form and general grouping of bacteria can be reproduced, such as it is exceedingly difficult to delineate in a drawing, however artistically it may be executed. At the hands of only a few men has, however, the photographing of bacteria been really successful, and one too frequently sees the organisms represented as faint, indistinct bodies with ill-defined outline, and surrounded by a hazy zone, the first fault being due to unskilled execution of the staining processes, and the second to the employment of indifferent objectives and bad illumination of the object; on both which points special care must be bestowed, as nearly all bacteria require for their investigation high-power objectives.

Micro-photography, in its application to bacteria, must be dealt with under two headings: 1st, the preparation of the bacteria by suitable staining methods; 2nd, the process of photographing them; and I propose on the present occasion to deal with only the former.

It may be required to photograph bacteria under two distinct conditions, according as they are present—1, in the free state or in fluids; 2, in the organs and tissues of

the animal body; and for each of these conditions a special mode of preparation must be adopted.

As examples of bacteria occurring in a free state, or in fluids, I may take, from among many, the various coloured (chromalogenous) species of which colonies grow on the surface of eggs, meat, bread or potatoes; the putrefactive bacteria in decaying meat or vegetable infusions; the sputum (expectorated matter) from the lungs of a pneumonic or tuberculous person; or the blood of an animal suffering from splenic fever.

To stain such bacteria the following mode of procedure will be found the best:—Place a minute portion of the bacterial fluid, or of a bacterial colony, by means of a previously heated platinum needle, on the centre of two cover-glasses (·004-·005,) and, laying one cover glass over the other, squeeze them gently together between the fingers, so that the bacteria are diffused over their surfaces in a uniform layer. Then slip them apart and leave them to dry. After a few minutes, pass the cover-glasses rapidly through the flame of a spirit lamp, so as to fix the bacteria on the glass. Cover-glasses so charged may be kept for an indefinite time; and if an interesting growth of bacteria is met with, it is always well to reserve some specimens in this way for future reference.

For all practical purposes it may be said that bacteria of which micro-photographs are to be taken must be stained with a red or brown dye, and by far the best medium is a saturated watery solution of vesuvine or Bismarck brown, which should be filtered before use. For precise work, it is always best to use a freshly-made solution, inasmuch as bacteria, torulæ, and fungi, develop in it after it has been made some time, and their presence may give rise to an erroneous observation.

The cover-glass, with the bacterial surface downwards, should be floated on the top of the solution, and allowed to remain there for approximately an hour, though experience will show that the time required will vary according to the specimen of dye which is used. It is then removed from the solution, washed in water, and afterwards in a half or one per cent. solution of acetic acid, and allowed to dry—or, if time is an object, pressed between folds of blotting-paper—and its surface brushed with a camel-hair brush to free it from particles of dust, &c. It is then mounted in Canada balsam, and is ready for microscopical examination. The best form of balsam for mounting bacteria is that which is dissolved in xylol, which is very easy to work with, and does not abstract the dye from the bacteria. If the slide is to be examined with an oil immersion objective, the edge of the cover glass should be sealed, when the balsam is dry, with Hollis' glue. If the various stages of the staining process have been properly carried out, the bacteria should appear deeply stained and sharply defined.

Turning next to a consideration of bacteria as they occur in the organs and tissues of the body, I may cite, as examples, the various infective diseases of man and the lower animals. The organs must first be hardened by one of the numerous hardening processes, of which the one I generally adopt myself is to place the organ, or a selected portion of it, for forty-eight hours in dilute methylated spirit (1-2), and then transfer it to pure methylated spirit, in which it may be kept for an indefinite time. When it is sufficiently hardened, sections must be made by hand, or with one of the microtomes. For photographic purposes, the sections should be cut as thin as possible, for with thick sections a fogged picture will result. A perfect section, but one rarely met with, would be one which is of the thickness of a single cell throughout.

To stain the sections, they are placed in the saturated watery solution of vesuvine or Bismarck brown, and allowed to remain there about an hour, then washed with distilled water, and afterwards in a half to one per cent. solution of acetic acid, dehydrated in absolute alcohol, clarified in oil of cloves, and mounted, with Canada balsam, in xylol. The bacteria should appear as deeply stained bodies standing out in bold contrast with the diffusely and more lightly stained tissue elements. The specimen should be covered with an extra thin cover-glass (·004-·005), for, if a thicker cover-glass is employed, a high-power objective may not be capable of working through it. The thickness of the cover-glass can be easily guaged by Elliott's guaging machine.

The staining of bacteria, whether on the cover-glass or in sections, will be found, with a little care and practice, perfectly easy. The only difficulty is to hit off a mean between understaining and overstaining, so that the bacteria are neither too faintly nor too deeply stained; but this is easily overcome.

PHOTO-LITHOGRAPHY AND PHOTO-ZINCOGRAPHY.

BY MAJOR J. WATERHOUSE, B.S.C.,
Assistant Surveyor-General of India.

CHAPTER XVII.—MISCELLANEOUS PROCESSES—(*continued*)

2. *Oleate Processes.*—We have already referred, in Chap. XII., to the processes of Conduché, Cutting and Bradford, Morvan, and others, in which a negative chromocolloid image on the stone is washed over with a solution of soap, so as to form an insoluble soap with the lime of the stone. A few processes have also been proposed in which metallic soaps or oleates have been made use of to obtain an image directly on the stone.

Quaglio employed the oleate of silver, or so-called silver soap, prepared by precipitating a solution of Marseilles soap with a solution of nitrate of silver. The silver soap thus produced is a yellowish-white, soft, wax-like body. It is rapidly decomposed in sunlight, five to seven minutes' exposure blackening it completely. Rubbed on any suitable material, and exposed to light under a negative, it yields a proof with a fine glossy black colour, specially well fitted for working over in oil colours. The image is fixed with diluted hydrochloric acid, followed by hyposulphite of soda, or cyanide of potassium.

Quaglio first of all prepared the stone by treating it with a solution of nitrate of silver, followed by a solution of soap. This gave very good images, but the difficulty was to remove the unaltered parts without removing the image also. Cyanide of potassium was found to answer best.

M. Quaglio then took a sharp-grained stone, such as would be used for chalk drawing, and covered it first with a solution of gum-arabic; it was allowed to dry, and, after standing some hours, was washed over with water. The stone was then covered with the silver soap, applied with a small flannel pad, and rubbed on till the whole stone showed an even greasy lustre. It was then exposed under a negative for about half-an-hour in direct sunshine. The image produced was exceedingly sharp and beautiful. The stone was then washed with rectified naphtha, gummed, and then inked up, in the same way as weak transfers, with a sponge dipped simultaneously into gum-water, turpentine, and transfer ink, and rubbed gently over it, at the same time being rolled up several times with the roller.

A proof showed the picture with all shades of half-tone. After a few pulls the image may be etched with weak hydrochloric acid and gum. The gum is allowed to dry, and the stone left for some hours, and then rolled on and treated as an ordinary lithograph. Herr Liesegang found this process very successful for half-tone work.

Mr. Carey Lea has suggested the use of some other metallic oleate which will easily part with its oxygen, such as the per-oleate of iron, obtained by precipitating Castille or Marseilles soap with a neutral persalt of iron, or iron ammonia alum.

Mr. Isaac Rehn, of the United States Patent Office, has proposed a transfer process in which a soapy coating is given to the paper before exposure, and by its decomposi-

tion provides sufficient greasy matter to make the transfer without the transfer print requiring to be inked after exposure, as in the usual processes.

Paper is first coated evenly on one side by meaus of a soft sponge with a mixture of—

Gelatine or gum	4 parts
Sat. sol. bichromate of potash, ammonia, or chromic acid ...	8 ,,
Water	32 ,,

The paper may also be floated on or immersed in this solution, in which case the latter should be diluted one-third.

When the paper is dry it is exposed to light for ten minutes in order to thoroughly oxidize the coating, and can then be kept for use.

When required to be used, the sheets are coated a second time by floating on the warm gelatinous solution, and dried. They are next coated with a roller charged with a composition made by taking—

Yellow soap	1 ounce
Arrowroot, starch, or flour... ...	½ ,,
Water	1 quart
Colouring matter (blue by preference)	*quant. suff.*
Sat. sol. bichromate of ammonia ...	2 drachms

Dissolve the soap in a pint of water by heat, and the starch in the remaining pint, mix the two solutions, and evaporate to the thickness of lithographic ink. The colouring matter is added at any time before the mass is applied to the paper.

The bichromate is added at the time of using, and in a dark room. A stone is coated with the mass, just as with lithographic ink; the paper is laid face downwards upon it, passed through the press, and is thus coated with the sensitive compound.

The paper may also be sensitized by floating it on a warm solution of—

Gelatine	3 ounces
Dissolved in water	15 ,,
Soap	3 ounces
Dissolved in water	15 ,,

Mix, and add in the dark room—

Sat. sol. bichromate of ammonia...	12 ounces
Colouring matter...	*quant. suff.*

When dry, the paper is exposed as usual under a negative from five to fifteen minutes, and then is washed in tepid water, dried, and transferred.

The object of the oxidation of the first layer on the paper is to secure a smooth unmovable basis on which to make the impression, so that the lines may have a better and more clearly-defined edge.

The process is said to give very sharp results for line work, as there is no spreading or washing away of the lines.

LECTURE ON PHOTOGRAPHY.

BY PROFESSOR J. MILLAR THOMSON.

On Monday last, Mr. J. M. Thomson, F.R.S.E., F.C.S., delivered a lecture before the members of the Society of Chemical Industry, at Burlington House, entitled, "Photography for those engaged in industrial pursuits." The lecturer first explained the apparatus required, remarking that the cameras now in vogue are very much lighter than those employed some years ago. In speaking of the swing-back, he found the latter only of use in portraiture when it was necessary to reduce the size of part of the image—as, for instance, the feet of a person when in sitting posture. Diagrams of the various lenses were shown, the lecturer advising beginners to employ the single lens. Shew's camera adapter, and a shutter of the flap-and-drop principle, were next described. In speaking of dark-room illumination, it was stated that screens of "cherry fabric" were preferable to those of glass. The sensitive film was next discussed, the collodion process being first explained. Special attention was given to the collodio-emulsion method: the processes of emulsifying, washing, ripening, and pouring were all described in detail. Reference was then made to the gelatine process. A negative and positive were put in the lantern, and the applications of both explained.

In referring to exposure, the lecturer remarked that, so sensitive were the gelatine plates now in the market, that there was little fear of under-exposure even when a shutter was employed, error through over-exposure being more frequent. Formulæ, and details of working the various developers, were next given, also the theory and use of restrainers and accelerators. The effect of hypo in the oxalate developer was assigned to the conversion of ferrous bromide into ferrous hyposulphite.

$$FeBr_2+Na_2S_2O_3=FeS_2O_3+2NaBr$$

The process of enlarging on gelatino-bromide paper was demonstrated by exposing a portrait of the chairman in the lantern, and developing the film on the screen with a brush. Printing with the albumenized paper and the platinotype processes were referred to, a print of the latter being developed before the audience. In speaking of the applications of photography to scientific purposes, the lecturer regretted that the time at his disposal obliged him to touch only briefly on the subject. For photo-micrography it was stated that a small microscope and 5 × 4 camera answered most of the purposes of a more expensive apparatus. With large powers up to a quarter-inch, no difficulty would be met with, and the special correction of the lenses for the coincidence of the chemical and visual foci was hardly necessary. Koch's elaborate photo-microscopic apparatus for reproducing bacteria was shown; the focussing in his apparatus is performed by a cord attached to the fine adjustment, and wound on a wheel at the side of the focusing glass. Some beautiful photographs produced with the microscope were shown on the screen. Among the examples of special interest was that of starch granules produced with the aid of polarized light. In concluding the discourse, the lecturer remarked that he had attempted to describe the methods of photographing with the aid of simple apparatus, and if he had succeeded, his object of addressing the Society was attained.

Correspondence.

ELECTRIC LIGHT IN THE LANTERN.

Sir,—With reference to a question about the practicability of using the electric light in the lantern, by Mr. A. R. Dresser, in your esteemed paper of November 21st, I beg to give my mite of experience in this direction.

The arc light, of course, is expensive, and not steady enough, and is therefore seldom used. I tried the Swan incandescent light, worked with no less than nine good sized Bunsen cells, but soon abandoned its use, the trouble to put together the battery being too great. After that I tried a small one-candle power similar lamp, with an extra thick carbon thread; this, when worked with only three cells, gave a most brilliant white light, but after two hours' use it was burnt out. This light seems to me to be a very good light for the lantern, but the lamp wants improvement to stand the strong current.

Lastly, I tried the simple platinum wire made incandescent by galvanic energy, coiled up snake-like to produce an incandescent disc of about 1·5 cm. diameter. The wire is less than 1 m.m. thick. Working with three Bunsen cells, the light is all that can be desired for moderate intensity. It is cheap and safe; the cells are easily charged and kept in going order; the lamp is always ready for use, and on applying a simple current regulator the light is perfectly manageable. I never tried an accumulator, but think that it could be profitably used, the required current being comparatively weak.

Milan, Nov. 28. Frederico Widmer.

Dear Sir,—It is nearly twenty-five years since I began my first experiments with the electric light, when spectrum analysis, by means of the electric arc, was the grand climax of nearly all scientific lectures. Then, of course, we had to employ a lantern, and maintain the arc accurately in the focus of the objective, and we had no other source of electricity than that derivable from some 50 cells of Grove

or Bunsen, which it was not then thought such a stupendous effort to set up as to deter the attempt.

For a period of some ten or twelve week-day evenings I have set up 40 cells for the electric light, never having a failure; but, on the contrary, I could amalgamate my plates, mix my acids, charge the cells, connect up, and have the light at work giving a good arc a quarter of an inch long, and all this by the expenditure of about two hours' work. I have frequently set up 60 cells for the purpose.

The battery enables the exhibitor to give a demonstration which few would attempt if a dynamo and "power" had to be procured. A battery of 40 or 50 cells, acids, and all the requisites can be conveyed upon and within a four-wheeled cab; not so a dynamo, to say nothing of the engine. My 1200 candle Siemens' machine weighs over 3 cwt. Loudon cabs have been known to break down with the weight of the "fare" alone. A 1200 candle machine will consume 2-horse power, and need a 3-h.p. engine to give a steady light. Where power is obtainable and convenient I shall certainly run the machine, because the cost is much less when once the "installation" is set a-going.

It may not be out of place here to draw attention to the figures which have just been collated from the electrical installation at the Health Exhibition. It must be strongly borne in mind that the conditions were by no means favourable to show the best result attainable. There were 11 boilers and 6 engines, indicating a total of 1306 horse-power, and the coal consumption is stated to have been 3·2 lbs. per indicated horse-power per hour. No batteries yet constructed can compete with such figures as these, which, stated roughly in other terms, mean that about 600 candle-power could be maintained for one hour by a consumption of slightly over 3 lbs. of coal. Upon the authority of Mr. Preece—who for experiments employs a 2-h.p. *gas* engine, using street gas to drive a dynamo—he obtains about 50 per cent. more light than the same gas would yield if it were consumed in ordinary gas burners!

Gas-works are to be found in small towns now, and gas engines are very steady-going machines. What we want is a "portable" gas engine, 3-h.p., with dynamo all on one carriage. Attach a horse and trot it off to the place, connect the engine to the gas-pipe by a flexible hose, turn on the tap, strike a light, and, presto, there you are!

All the rest is mere detail. Should the subject from any point of view be considered worthy of exhaustive discussion, I should be glad to give your readers the benefit of my experience.—Yours truly,

George F. Williams.

A LANTERN SLIDE CLUB.

Sir,—In the present day there seems to be a mania for forming clubs: we have Photographic Clubs, Rifle Clubs, Tricycle Clubs, Athletic Clubs of all kinds, Gun Clubs, Chess Clubs, and, in short, clubs to meet every possible phase of sport or pastime, except only *Lantern Clubs;* and yet one would have thought the advantage of a number clubbing together so as to get the run of a large number of the somewhat costly slides would be so manifest as to induce someone to have started a Lantern Club long ere this.

The idea that suggests itself to me is a club to consist of (say) 20 or even more members, each member binding himself to purchase (say) 50 first-class slides, different to those to be purchased by any other member, and then proceed mutually to exchange upon the ever-circulating principle. By such an arrangement no doubt it would be possible to make advantageous terms with some good maker of slides, and thus each member in a club of 20 *would have the use in course of time of* 1,000 *slides at the cost of* 50. Or, the Club might be formed on a still different basis, under which each member paid an entrance fee and annual subscription, to be devoted to the purchase of slides, each member having the right to borrow a certain number at certain intervals.

Should there be any persons wishing to form such a Club, if they will address themselves to me, I will see how best to bring them together, so that a start in the direction I have indicated, or one of them, may be made before the present lantern season gets much further advanced.—Yours faithfully,

Henry Smith.

River Cottage, Hornsey, N.

EXTRA RAPID CEMENTED DOUBLETS.

Dear Sir,—Your report on the last technical meeting of the Photographic Society of Great Britain conveys the idea that there was an opinion prevalent at the meeting that there is no advantage in the extra rapid symmetrical doublet, that opinion being confirmed by the fact that opticians "*seldom construct symmetrical lenses*" with an intensity so high as $\frac{f}{6}$. Leaving aside the question whether that is a good reason against such a lens being turned to good account, the question arises which is the type of lens that is entitled to work with such an aperture. Mr. Dehenham gave it as his opinion that it was the Petzval portrait lens; but there is evidently a desire on the part of opticians to produce lenses besides the portrait form of greater rapidity than $\frac{f}{8}$, to wit, the "Steinheil Antiplanet." It seemed to me by no means clear that the meeting was of the opinion that a rapid doublet could not satisfactorily work with an aperture of $\frac{f}{6}$, and no reasons are given why it should be excluded from doing so.—I am, dear sir, yours respectfully,

J. R. Gotz.

EXHIBITION AWARDS.

Sir,—In the letter on the above subject, in your issue of November 21, signed George Smith, there are statements regarding matters of fact which are incorrect. Will you allow me to state that Mr. Gale personally handed to the Assistant-Secretary, at the Gallery, before 9 p.m., September 25th, a box of twenty lantern slides, made by himself from his own negatives, together with a letter of advice; that these were the only slides received from him, and that they are the same ones that were shown on the screen before the judges at the time of the competition for the medal. The paragraphs in the Society's circular, relating to lantern slides, read as follows:—"Slides (which must not exceed 3¼ inches in height) must be sent in either on or before Thursday, September 25th (to come with other exhibits before the Judges of Awards), and will only be eligible for award when both the negatives and slides are the work of the exhibitor." "The judges are instructed to reserve one medal for Lantern Transparencies (if they find them worthy of award)."

It will be seen, therefore, that the award to Mr. Gale was made strictly in accordance with the regulations.

I say nothing at present with regard to the other allegations in the letter referred to, which are either beside the point at issue (the legality of the award), or are matters of opinion only.—Yours faithfully,

W. F. Donkin,

Hon. Sec. Photographic Society of Great Britain.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 27th inst., Mr. W. Cobb in the chair.

In the course of a conversation on frilling, Mr. Ashman mentioned that where the usual remedies failed, heating the developer proved effective.

Mr. J. H. Trinks, when working in exceptionally high temperatures, prevented frilling by soaking his plates an hour in chrome alum solution, and surrounding them during development in a freezing mixture. He then showed a plate developed with mixed ferrous-oxalate and pyro, in which a black image was obtained. After treatment with hydrochloric acid 1-2, a clear and bright image remained. He wished to know why this occurred.

Mr. W. K. Burton said ferrous oxalate and pyro produced ink, and the acid dissolved it.

Mr. A. L. Henderson thought the ink must have prevented frilling. Emulsions, he said, precipitated with alcohol were less likely to frill than those containing meta-gelatine.

Mr. Hart's suggestion to introduce bichloride of mercury into emulsions was further considered, and certain experiments to prove its value were suggested.

Mr. Burton showed an application of the potassium chromate colour test for determining the duration of floating alb. paper on the sensitizing bath. This was demonstrated by brushing the solution over a portion of the back of the paper previous to floating. Soon after the paper was laid on the silver bath, a gradual deepening of colour occurred where the chromate salt had been applied. When the colour became deep orange, Mr. Burton considered the whole of the chloride was converted into AgCl, and the time occupied indicated the duration of floating necessary for that sample of paper.

The Chairman passed round sample prints, made by Marion's new method, on Alpha paper, and referred to a description of the paper published in the *Times* on the 17th ultimo (see page 755 of our last issue).

The prints—which were equal in vigour to good silver prints on albumen paper—were much admired, but it was considered that developed prints on gelatinized paper would not quickly supersede the older method of printing.

Mr. Trinks alluded to a plan which enabled him to make an ordinary platinum print appear as though it were a genuine copper-plate print. After washing, he passed the print through water (nearly boiling), which caused, if quickly dried, the surface to become uneven; it was afterwards put through the press.

A discussion then took place on developers, in which it was generally conceded that soda had the greatest power as regards the amount of detail obtainable, restrainers being unnecessary.

Mr. J. Henrick Trinks was elected a member of the Society.

Liverpool Amateur Photographic Association.

The annual meeting of this Association was held on Thursday, the 27th ult., Dr. Kenyon, President, in the chair.

The minutes of the October meeting were read and confirmed, and Messrs. Atkinson, Pooley, Pawson, Roose, Taylor, Webster, and Webb were elected members.

The appointment by the Council of officers for 1885 was as follows :—

President—Mr. J. H. Day.
Vice-Presidents—Mr. A. W. Beer and Mr. P. H. Phillips.
Treasurer—Mr. J. H. T. Ellerbeck.
Council—Messrs. W. Atkins, Rev. G. B. Banner, Rev. T. B. Banner, Messrs. R. Crowe, J. A. Forrest, Dr. Kenyon, Mr. W. H. Kirkby, Rev. J. H. Palmer, Mr. H. Rutter, Rev. A. J. Scott, Messrs. E. Twigge, and W. A. Watts.
Librarians—Messrs. R. Crowe and W. W. Hughes.
Auditor—Mr. W. H. Wharmby.
Hon. Secretary—Mr. W. N. Atkins.

The Hon. Secretary read the annual report, of which the following is an abstract :—

The accession to the numbers of names on the books has been the largest annual increase recorded in the archives of the Society. Thirty-seven new members have been elected. There have been seven resignations, and no losses during the year by death. The numbers of members on the books at the close of each of the last five years are as follows :—1880. 71 ; 1881, 78 ; 1882, 93 ; 1883, 115 ; 1884, 145. There has been no falling off either in the interest of the monthly meetings of the year, or of the numbers of members attending them. During the summer months numerous excursions have been made, which were productive not only of much enjoyment, but of profitable photographic experience and work. Donations to the Library have been received from Captain Abney, Rev. H. J. Palmer, Mr. Watts, Mr. Maurice Jones, and Mr. Scott ; and to the album from Messrs. H. N. Atkins, Watts, Williams, Hartley, Wharmby, and others. The beneficial effect of the annual competitions, as incentives to useful emulation, and as spurs to careful and artistic work, has shown no diminution in the past year, and the Council trust that the subjects selected for the competition of 1885 will be productive of a similar satisfactory result. These subjects are as follow :—"Instantaneous," "Farm Yard," "Rocky Shore," "Stereoscopic," "Cottage Door," "Animal Study," "Interior," and "Shipping or Marine." A presentation print will be selected by the Council before the close of the year for distribution among the members.

The report included a list of the papers contributed at the meetings, as also acknowledgment of thanks due for favours received from several quarters.

The report was passed.

The Treasurer's report showed a balance in hand of about £40.

The Rev. T. B. Banner and the Chairman spoke very warmly of the labours of the Hon. Secretary, now about to retire from his post.

The Rev. H. J. Palmer expressed his cordial thanks, not only to Rev. T. B. Banner and Dr. Kenyon for their kind words with regard to him, but also to every member of the Society, both present and absent, for their kindly feeling.

The following addition to the Rules was adopted :—"All members elected on and after the January meeting, 1885, shall pay an entrance fee to the Treasurer of 10s. 6d."

The Chairman reminded the members of the *soirée* in St. George's Hall, on December 10th, and gave notice that all exhibits for the Association's display should be sent to Mr. Ellerbeck's, 54, Bold Street, on or before December 9th, or on the 10th to the Committee in St. George's Hall.

In this year's competition the awards were announced as follows :—"The Brook," Mr. W. H. Kirkby ; "Cattle," Mr. J. H. T. Ellerbeck ; "Fruit," Mr. P. G. Hall ; "Architecture," Mr. W. H. Kirkby ; "Mountain Forms," Mr. P. G. Hall ; "Snow Scene," not awarded ; "Shipping," Mr. J. H. Day ; "Repose," Mr. P. G. Hall ; "Own Emulsion," Mr. W. H. Kirkby ; "Best set of Pictures," Mr. P. G. Hall ; "Best Picture of all," Mr. P. G. Hall.

Messrs. Thompson, Riley and Banks were re-elected, *nemine contradicente*, as honorary members.

The Chairman said that the Council would be glad to receive negatives suitable for enlargement for this year's presentation print, and requested that such negatives should be sent to Mr. Ellerbeck, 54, Bold Street, on or before Monday, December 15th.

A resolution was passed that the following bye-law, recommended by the Council, be adopted :—"That after due notice has been given by the Treasurer, that if arrears of subscriptions be not paid within three months, members in arrears shall cease to receive notice of meetings."

The members then adjourned to a lower room for the inspection of the competition pictures of the present year.

Hyde Amateur Photographic Society.

This Society, formed a fortnight ago, held a meeting on Wednesday evening in the Mechanic's Institute, when a collection of instruments, photographs, and etchings, were exhibited. Mr. W. Nuthall presided, and there was a very fair attendance of ladies and gentlemen. Round the room numerous photographic specimens and a few water colours were arranged, and the apparatus was displayed on a table. Amongst the instruments were various cameras by first class makers, lenses for the sciopticon camera, a neatly-constructed burnisher, various kinds of developing lamps and sciopticon lanterns, an oil lantern giving a beautiful ten-feet picture, consecutive delivery box (in the railway ticket style) for use in lantern exhibitions, and a biunal lantern, fitted with mixed jets, and capable of giving a picture up to twenty feet in diameter.

Mr. F. W. Cheetham (President of the Society) showed several water-colour drawings, and amongst a number of photographic specimens an excellent photo. of himself, executed by his own hand, which was accomplished in the following manner :—The table at which he sat was first focussed, and then the operator actuated the lens by means of cotton-thread.

Dr. Sidebotham (Vice-President of the Society) exhibited apparatus and a number of photographic specimens, as also did Mr. George Batty, one of the members. Cameras and lenses were also exhibited by Mr. John Crowther (Secretary), Mr. John Pennington (Treasurer), and Mr. McLean, (a member.)

Some time having been spent in examining the exhibits, Mr. F. W. Cheetham gave a magic lantern entertainment, throwing on the screen photographs of persons and places of interest taken by himself and Dr. Sidebotham. Remarks were made by the Rev. J. K. Smith, Councillor Cheetham, Dr. Sidebotham, Mr. H. Bardsley, Mr. F. W. Cheetham, and Mr. Crowther, and a very pleasant entertainment closed with thanks to the exhibitors and to Mr. Nuthall for presiding.

AMATEUR PHOTOGRAPHIC ASSOCIATION OF VICTORIA.

THE Association is progressing satisfactorily and doing good work. Practical demonstrations of the different photographic operations are given at nearly every meeting, with good results.

At the meeting held on 6th October, Sergeant FENTON read a paper on the "Preparation and Purification of Photographic Chemicals," and being an amateur chemist of known ability, a large number of members attended, and listened with great attention to his remarks, finishing by asking him innumerable questions, which were satisfactorily answered.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next ordinary meeting of this Society will take place on Tuesday next, December 9th, at 8 p.m., in the Gallery of the Royal Society of Painters in Water-Colours (whose winter exhibition is now on view), 5A, Pall Mall East.

PORTRAIT OF MR. F. C. BEACH, OF NEW YORK.—Messrs. Morgan and Kidd have forwarded us an excellent gelatino-bromide enlargement upon opal from a cabinet portrait of Mr. Beach. Gelatino-bromide enlargements upon opal have certainly much to recommend them as superior to the old-fashioned collodion transfer, and it is remarkably easy to put artistic work upon gelatino-bromide pictures taken upon opal glass.

THE EFFECT OF MOISTURE ON THE REFRACTION OF POLARISED LIGHT, BY R. T. GLAZEBROOK.—The author has described some experiments he has been engaged on lately at the Cavendish Laboratory. Plane polarised light is made to fall on a plate or a wedge of glass at various angles, and the position of the plane of polarisation determined. It is found that this depends greatly on the hygrometric condition of the air in the neighbourhood of the glass. If moist air be blown on to perfectly clean glass, the plane of the polarisation of the emergent light is displaced from its normal position in one direction, while if dry air be blown it is displaced in the opposite direction. At an angle of incidence of 60° the difference between the two positions is from 6′ to 8′. If, however, the glass be not perfectly clean, the effect of moisture is at first the same as that of dry air, though on stopping the draught an opposite effect is observed. The author assigns as the cause of this the heating of the surface which, as Magnus discovered, is produced by a draught of moist air. He finds on repeating Maguus's experiment that the heating is not produced if the glass be clean, and he shows by an independent experiment that slight local heatiug does produce an effect on the plane of polarisation in the same direction as that due to the dry air.—*Chemical News.*

LECTURE ON PHOTOGRAPHY.—On Tuesday, the 2nd inst., Mr. T. C. Turner, jun., read a paper at the Finsbury Park Literary and Scientific Society, on "Photography and its Applications." The effect of light on certain substances was first explained, and as an example the blackening of chloride of silver by the actinic rays was shown. The process of development was successfully demonstrated before the audience by developing both a platinotype, and a gelatine plate. In speaking of instantaneous photography, the lecturer pointed out that by means of the new gelatine process, and a detective camera, it is possible to secure photographs without the knowledge of the persons photographed. After a brief description of the application of photography to the pigeon-post, the microscope, and astronomy, the lecture concluded with a lantern demonstration. Among the photographs shown on the screen were Mr. Cobb's celebrated London scenes, Mr. Jennings' photo-micrographs of the flea, Mr. Wellington's gelatino transparencies, and Mr. C. Ray Woods' astronomical slides.

PHOTOGRAPHIC CLUB.—The next meeting, December 10th, will be the Annual Dinner, at 7 p.m.

To Correspondents.

*** We cannot undertake to return rejected communications.

JOE.—1. Your nitrate of soda probably contained a large proportion of chloride, and the "mass like wet plaster of Paris" is the chloride of silver which was thrown down. Do not attempt to "tinker" the bath any more, but add enough common salt to throw down all the precious metal as chloride of silver, and either reduce this by fusion with carbonate of soda, or sell it to a refiner; then make up a fresh bath. 2. The best quantity to add to each ten ounces, is none.

TADRUNS HANNA.—1. The method of cleaning you speak of will answer very well; in fact, you cannot adopt a better method, although you may find one somewhat easier. 2. Isinglass is suitable, but before using it you should soak it in several changes of water to extract soluble matter. 3. There is no "best" developer, but that you mention is excellent for general use. 4. A deep ruby colour is generally preferred. 5. The gelatine solution never flows on glass so readily as collodion flows, but its flow can be facilitated by breathingon the glass. 6. There is no book that treats of emulsion making with special reference to the climate of Upper Egypt, and you can have nothing better than the book you mention.

CHEMICUS.—Carefully carry out the directions on page 619 of our present volume, and you will obtain a good result.

R. F. DIXON.—1. Yes, and in our opinion the enlargement will be much better than the original if the work is skilfully performed. 2. Undoubtedly it would be cheaper. 3. The lenses you refer to are excellent value for the money, but you must not expect them to approach in perfection the instruments of the best makers. Of those mentioned we should recommend the second; and certainly not the wide-angle lens for general work.

J. WHITELAW.—In last week's number there is an example of what we referred to (page 762). We have posted what you ask for.

CELT.—You cannot do better than to obtain a lens of a similar kind to that you already possess, but of about half the focal length.

G. F. WEBBER.—It will answer very well for the purpose you mention.

J. T. SMITH.—1. A series of articles on the ferrotype process appeared in our volume for 1881, and you can doubtless obtain the volume by advertising for it. 2. The so-called encaustic paste—white wax 1 ounce, and oil of turpentine 5 ounces.

T. D. P.—One of them, and that a very good one, is to be found in the very number containing the answer you refer to.

FRANK PIPER.—1. An article on the subject is to be found on page 613 of our volume for last year. 2. Under the circumstances it is extremely probable that the engraving is copyright, and if you make copies, you must not sell them.

R. W. G.—Parts by weight are intended—ounces, if you like—but if you only want a moderate quantity, you had better take it in drachms.

F. M. AND CO.—The address of the Meisenbach Company is 31, Farringdon Street, London, E.C.

S. S. F.—1. We cannot tell you of any one who will be sure to do what you require, but you might write to Messrs. Marion and Co., of Soho Square, London. 2. Thank you, we shall be pleased to have a copy.

R. V. H.—They were done in America, but you had better write to the Platinotypo Company.

ALEX. A. INGLIS.—Thank you for the photographs, which are excellent, and we hope to make use of some of them.

THIO.—We can hardly judge, but should suggest that your best way will be to write to Mr. Cowan. If you will send a letter to him under cover to us, we will forward it.

W. P. M.—We cannot tell you the exact dates, but as there is not much latitude possible, you can easily ascertain by inspecting the files at the offices of the journals in question.

C. R. BEAUMONT.—1. Mr. Carter's paper, which you will find on page 772, contains much that is interesting, and you will gather useful information from "Hunt's Photography," a copy of which can often be had second-hand. 2. We shall be very much pleased to have a description of your new camera.

C. N. AND CO.—With careful work, we think you ought to recover fully one half.

C. C.—If you colour with anilino dyes or with water colours (mixed with ox-gall) the varnish will not affect either colours or print. We assume you to refer to a print on albumenized paper, and as a varnish we recommend dammar dissolved in benzole, sixty grains of the gum to each ounce of fluid.

C. E. G.—We cannot tell you with certainty, but will post you the addresses of some Paris houses.

S. S.—If so, it shall be posted to you.

'The Whittaker of the Photographer.'—*Chemical News*

OVER A QUARTER OF A CENTURY OF PUBLICATION.

ON DECEMBER 20TH, PRICE 1s., PER POST 1s. 4d.,

THE

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THE BRIGHTON CATS.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1371.—*December* 12, 1884.

CONTENTS.

THE HYDROXYLAMINE DEVELOPER.

MANY persons are now experimenting with the hydroxylamine developer of Egli and Spiller, and among the most recent workers in this direction may be mentioned Herr Scolik, of Vienna, who read a communication on the subject at the last meeting of the Vienna Photographic Society.

In the first place, Scolik tried the original formula, and the image developed slowly, and was rather weak; Scolik also found, that to obtain the same vigour as with pyrogallic acid, a longer exposure is required. He, however, by leaving out both bromide of potassium and citric acid, obtained much better results, and the following is his formula:—

60 parts of water
3 ,, stock solution of hydroxylamine hydrochlorate (1 and 15 of water)
5 ,, stock solution of caustic soda (1 and 8 of water)

Under these circumstances the image appears more quickly than with pyrogallic developer, and well graduated vigorous negatives are obtained—in fact, results much resembling wet plate negatives.

If only three parts of the hydroxylamine are used, the developer is too weak for general use; but five parts of the solution may be used when a short exposure has been given.

Too much soda must, according to Scolik, be avoided, as it causes the films to frill or to blister; but these troubles may be generally avoided by adding alcohol towards the end of the development.

In commenting on the present high price of hydroxylamine salts, Scolik remarks that a reduction may be expected; and according to present prices he estimates the cost of the various developers as follows:—

Pyrogallic developer, with glycerine ...	1·2
Potash developer	1·4
Iron oxalate	1·5
Hydroxylamine developer	5 to 8

PORTRAITS OF PUSSY.

THERE is but one photographer who stands out prominently as a photographer of cats, and that photographer is Mr. Pointer, of Brighton. Puss—taking her in general—is by no means a good sitter, for who ever saw a cat absolutely still? Even when most intent on watching a mouse, or other head of choice game, there is invariably a swaying motion of the tail; and although a cat may be fast asleep, the motion resulting from respiration is always considerable.

It is not everyone who can become a successful photographer of cats, as there are many persons with whom puss will never be friendly: although we much doubt whether the cat's sentiment of dislike to a person is ever so intense as that of the Duke of Noailles towards the whole feline race; it being recorded of this gentleman that he was made uneasy even by the proximity of the picture of a cat, notwithstanding that the picture was unseen, and in an adjoining room.

Mr. Pointer presents us with his own portrait, as he once

appeared with three of his pets; and it seems to us that we have here the same trio of cats that are represented in our supplement; but one must not suppose that Mr. Pointer by any means confined himself to these in making the series of about two hundred cat pictures which he publishes. In the greater number of cases, he tells us, the cats were entire strangers to him; but he has seldom any difficulty, as Mr Pointer and a cat are always fast friends immediately after the first introduction.

On the next page we have "The Connoisseur," in which the white cat is looking at the portrait of—we will suppose, her master.

In "The Careful Nurse," and "The Attentive Pupil," we have two more of Mr. Pointer's best studies.

The photographer of cats has certainly one advantage

on his side, as it is by no means easy to make puss assume an ungainly or awkward position.

"THE CONNOISSEUR."

were reproduced as Meisenbach blocks, and accompanied by a suitable text; while others besides children would be pleased to possess such an album.

FRENCH CORRESPONDENCE.

INSTANTANEOUS EXPOSURES—STANDARD SENSITOMETER—GELATINO-CHLORIDE PRINTS—PHOTOGRAPHIC ACCESSORIES—ACID-RESISTING GLAZE—BALAGUY'S FILMS—PELLICLE PAPER—TYPO-ENGRAVING PROCESS—SULPHO-CYANIDE FIXING SOLUTION—BUST OF DAGUERRE.

Method of Measuring Instantaneous Exposures.—M. de Labourne Puvinel recommends, as a means of measuring rapid exposures, the reproduction of a polished white

We cannot help thinking that Mr. Pointer's series of cat life would make an admirable child's book if the pictures

THE CAREFUL NURSE.

metal ball allowed to drop freely in front of a black curtain or screen, against which is placed a graduated scale. The shutter is set in action simultaneously with the fall of the ball, and on the negative a light line is visible, indicating, with the aid of the scale, the distance travelled by the ball during exposure. Of course several calculations, too complicated for practical photographers, have to be made to arrive at the exact duration; therefore M. de Labourne Puvinel has drawn up a table stating the exposures necessary for all the different lengths of the distances passed through from the top of the scale. It seems to me very intricate, and I much prefer the chronometric method described in my last letter. In this latter case, no such calculation is necessary, and it can be exactly determined by the angle subtended from the axis of the needle hand tracing two lines to limit it.

Standard Sensitometer.—The question of a standard sensitometer has again been discussed, with reference to a proposition made to the Photographic Society of France, that it should be entrusted to a special commission. I consider Warnerke's the best, only it seems desirable that a commission should be appointed for the thorough examination and comparison of all, so that the numbers given are absolutely identical. The thing does not present any difficulty so far, and I think a manufacturer might be easily found if Mr. Warnerke would consent to this proposal, leading to the first step in the establishment of a universal standard sensitometer. Other questions in this complex problem remain to be solved. A good standard of light must be determined upon. M. Warnerke's ingenious and convenient phosphorescent plate has several objections. Can all be gifted with an equal emissive power?—and is the duration of their luminosity warranted for a long time, and equal under all conditions? Replies have been made to these questions, but the doubt still remains. The lamp burning 42 grammes of oil in an hour is still used to verify the lighting power of gas, but this method is not easy to practise, and it is also liable to considerable variations—quality of the oil, state of the wick, &c. M. Bardy proposes Siemens' unit-lamp, as burning an invariable composition, the gauge regulating the height of the flame. The present price of the lamp here is forty francs, and that, with the illuminant costing fifteen francs the kilogramme, renders it too expensive to be generally used, and it seems doubtful

that the acetate of amyl is easily procurable. The use of a candle of a given size and make is liable to certain variations, but they may not be sufficient to interfere much with the practical value of the observations. It would be rash to comment upon a question of so much importance without experimenting; I therefore intend to make a thorough investigation, taking the Siemens' unit-lamp and comparing various candle flames with it. After a score or so of trials, I shall feel sufficiently up in the subject to pronounce upon my results. Similar experiments might be made with a petroleum lamp, trying various samples of petroleum, and noticing their differences. The necessity for determining upon a special developer has been objected to, but it may be rejoined that the film, showing the image least rapidly at first, by submitting to a prolonged development, comes out better than in those plates which give an image quickly.

M. Hutinet's Gelatino-Chloride Plates.—M. Hutinet, whose photographic mounting-board factory is so well known, is manufacturing wholesale both clear and opal plates covered with gelatino-chloride. They give very beautiful transparencies. The printing, toning, and fixing operations are carried on in the same way as albumenized paper prints. The exposure to light takes rather a long time, but the image may be watched as it appears on the transparent plates. For the opal plates, recourse must be had to photometric means, to ascertain when they have been sufficiently long exposed.

Photographic Accessories.—M. Stebbing has opened a depôt in Paris for photographic apparatus and accessories, particularly those of English make.

M. Chala's Acid-Proof Glaze.—M. Chala showed the Society a glazing substance having a carbon basis suitable for coating photographic dishes, cloth, paper, zinc, and other metals. The substance is called diamantine, and will bear a good rubbing without coming off.

Plates for Balagny's Pellicle Paper.—M. Balagny, with the view of having his pellicle papers used directly—that is to say, without having to put a glass in front of them, or expose between two glasses—proposes to deliver them provisionally attached to thin zinc plates, so that they may be detached during development. By this means the appearance of the image can be watched, and the reduction both in bulk and weight of plates is considerably reduced. To cause the pellicle to adhere, a solution of wax and a little resin in benzine is poured over the zinc plate. To apply the pellicle, paste them at the back, and press down on the waxed plate; they can be coated with gelatino-bromide in the usual way when dry. Pellicles already coated can be stuck down with an India-rubber preparation.

M. Alexeef's Typographic Process.—A Russian, M. Alexeef, has invented a typographic process, the results of which are similar to the "photo-ink" prints.

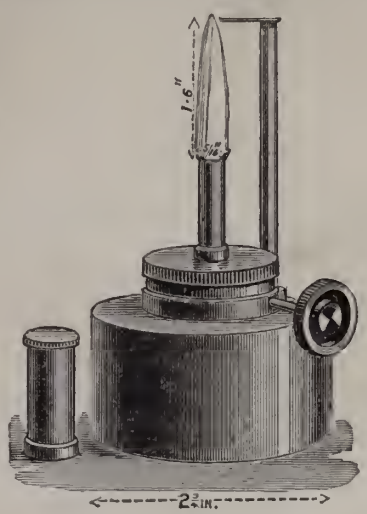
Reduction of the Bust of Daguerre.—A reduced copy of the bust of Daguerre, set up at Cormeilles-en-Parisis, has just been made. Anyone, therefore, desirous of possessing themselves of a bust of one of the fathers of photography, can procure one in Paris for the sum of eight francs.

LEON VIDAL.

THE SIEMENS UNIT LAMP FOR PHOTOGRAPHERS.

BY CAPT. W. DE W. ABNEY F.R.S.*

THERE are so many difficulties regarding a standard light that it has struck me that I might say a few words with advantage regarding the auxiliary standard which was proposed by Dr. Werner Siemens at the late Electrical Congress held in Paris in April last. Recently Dr. Siemens kindly presented me with one of them, and I have experimented with it both for photometric and photographic purposes. The lamp is illustrated in the figure. The two principal portions of it are a tube $\frac{5}{16}$ths of an inch in internal diameter, through which the wick passes, and a gauge to measure the height of the flame, which has to be 2·6 inches high. Whether the wick be a closely compressed one, or loose, does not seem to matter; cotton-wool will answer every purpose. The material burnt is acetate of amyl, which, though dear when obtained pure, is very cheap at all events in Germany, being sold at a few shillings a pound. It has a characteristic smell of pear drops, and is much used in confectionery. I am told, to give this particular flavour. The flame you see before you is a steady one when no draughts are about. In case of draught it may be enclosed in a glass tube with an air space beneath, but, as a rule, this is unnecessary.



The wick is trimmed even with the tube, and when out of use there is an extinguisher or cap which screws over it, making it air-tight, and thus precluding the evaporation of amyl acetate. After the lamp has been lighted a couple of minutes the flame assumes its normal height, and is regulated so that the point is just the height of the gauge. In this state it emits the light of a candle. It should be remarked that the acetate of amyl contains a large quantity of oxygen in proportion to the carbon, and hence requires but a small supply.

I have been trying this unit lamp for use with the sensitometer, and find that at a distance of 18½ inches from the plate, and with half a minute's exposure, it gives the same illumination as the phosphorescent tablet which is in my possession. I have repeatedly tried the same batch of plates at different times with the lamp, purposely disturbing the wick between times, and readjusting it to the height of the gauge. This gave always the same results on the plate exposed behind the sensitometer, showing that for this purpose it is a thoroughly reliable source of illumination. I cannot trace any effect of a difference in height of the barometer or thermometer. It is to be presumed that some slight variation must exist, but so far inappreciable, which is more than can be said when using the standard candle.

It may be asked, why substitute such a standard for the phosphorescent plate? The reason why I would do so is, that the light emitted by the phosphorescence is confined to one small portion of the spectrum, as a previous paper of mine has shown, and that as you mix iodide with bromide, the comparison of two plates, one iodo-bromide and the other bromide alone, when made by phosphorescence, is in favour of the latter, since the place of a maximum sensitiveness of the former is below the point in the spectrum at which the phosphorescent tables emits light. This being the case, I should like to see some such standard as this used, as it is handy, and only requires the application of a match to start it. It is also convenient for use in taking transparencies by contact. The exposure of a plate behind an ordinary dense negative, which registers 24 on the sensitometer at two feet distance, take one minute to give a good image. Such a lamp, too, is handy for travelling. It can be enclosed in a shade of orange paper, or by the cardboard lantern which I long ago recommended, and which is the simplest form of any lantern with which I am acquainted, and plates can be changed or developed by its light. Now as to the manufacture of such a lamp there is no difficulty; the form I have here is more expensive than is necessary. It will be seen that an ordinary spirit-lamp could be adapted to it, by replacing the tube usually supplied by a slightly longer one, and making the glass cover a little longer than is now done; even this is not necessary. The

* Read before the Photographic Society of Great Britain.

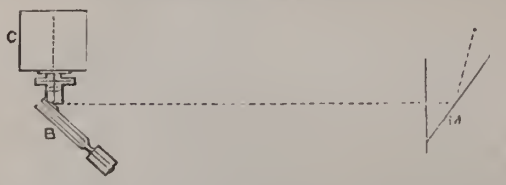
point to be attended to is to keep the heat at a fair distance from the spirit. I need scarcely enter into the subject of photometry with this lamp; suffice it to say that if the burner is of the dimensions I have given, and the flame kept to the standard height, every one has it in his power to reproduce the light of an unfluctuating standard candle. Here, then, is a point gained at once. Mr. Spurge brought forward the idea of using a gas flame of a certain height, and issuing from a hole of fixed diameter, to illuminate the screen he proposed to use with his sensitometer. As gas is not always available, it is probable that a modification, founded on the principles of the Siemens unit-lamp, might be utilised.

MEASUREMENT OF THE SPEED OF PHOTOGRAPHIC DROP-SHUTTERS.

BY W. H. PICKERING.

THE usual method adopted for this purpose depends on photographing a white clock-hand revolving rapidly in front of a black face. The chief difficulty in this case is to maintain a uniform rotation at high speed. To avoid this difficulty, and to determine the uniformity of exposure of any particular shutter under apparently like circumstances, the followiug method has been suggested. In carrying out the experiment in practice, I have had the assistance of Mr. J. O. Ellinger.

A tuning-fork, B, with a mirror attached to the side of one of the prongs, is placed in front of the camera-lens. This mirror is so arranged as to reflect into the camera C a horizontal beam of sunlight, which, before reaching the fork, has passed through a half-inch hole in a screen S, placed about ten feet distant. This produces on the ground-glass a minute brilliant point of



light. If the fork be set vibrating, the point will become a short, fine, horizontal line: if the fork be rotated about its longitudinal axis, the line will become a sinusoidal curve described on the circumference of a circle of long radius. A photographic plate is now inserted, and the drop-shutter attached. On releasing the latter, it will be found that a portion of the sinusoid has been photographed; and the precise exposure may be determined by counting the number of vibrations represented on the plate.

The mirror employed should be somewhat larger than the lens to be measured, so as to cover its edges during the whole exposure. The mirror may be glued directly to the prong of the fork with strong carpenter's glue, after first scraping off a little of the silvering at the edges of the glass. The rate of the fork is then determined, by comparison with a standard fork, by the method of beats.—*Science*.

COPYING MAPS AND PLANS.

BY THOMAS SCOTTON.*

THERE are various methods by which maps, plans, tracings, &c., may be copied. There is that of producing black lines on a white ground, but I shall now confine myself to two:—

First.—The ferro-prussiate process, by which copies may be produced with either white lines on a blue ground, or blue lines on a white ground.

Second.—The obtaining of copies with white lines on a blue ground.

The face of the drawing is placed against the glass of the printing-frame, and the prepared paper is then placed on the drawing (the prepared side on the back of the drawing). It is advisable that the paper should be somewhat larger than the drawing, so as to leave a margin exposed to show the action of the light upon it.

The exposure required in very bright sunshine varies from five to fifteen minutes, but in the very dull days of winter it may require two or three hours, or even a whole day. During the exposure to light, the paper assumes various tints, from a greenish blue to an olive tint. The print, when properly exposed, is taken from the printing-frame and immersed in clean water (which can be effected in any room) until the lines become purely white. The time required for washing occupies from five to ten minutes, but if warm water be used, the result is obtained much more quickly. Over-washing reduces the intensity of the blue ground. I find, from experience, the copies darken considerably whilst drying. If the prints are very large, say four or five feet in length, and three feet wide or more, great care is required in taking them out of the washing water to prevent them from tearing. To prevent this I generally get an assistant to hold a long wooden roller near, upon which the copy is placed.

If a line or figure has been left out by mistake on the original drawing before being copied, the same can be produced upon the printed copy by using a solution of soda and water.

To obtain blue lines on a white ground by this process, a negative must first be made, which is accomplished by placing in the printing-frame the drawing, with the back against the glass, then place over the drawing a piece of special ferro-prussiate paper (thin) prepared for the purpose, with the smooth surface against the face of the drawing, close the frame, and expose to the light. The progress of the negative print is rather difficult to verify and check; therefore, in this process the use of a second frame as a test frame will be found very useful. The negative print should be exposed at least three or four times as long as that by which white lines on blue ground are produced. The negative print, after proper exposure, should be washed in clean water, and dried as before mentioned. If this be properly done, the print when finished should show a clear dark blue on being held up to the light.

The negative print is then placed in the printing frame with the rough side against the glass, and thereon a piece of ferro-prussiate paper (the same as used for producing white lines on blue ground) with the prepared side against the negative. The exposure and operation to be the same as if producing white lines on blue ground. The copy thus treated will, when finished have blue lines on white ground.

I may also say the special negative paper can be used for producing white lines on blue ground by the following procedure as in the first instance.

Very pleasing pictures can be made by printing from negatives with this paper, which may be obtained ready prepared. If anyone choose to prepare his own paper he can do so by the use of the following formula:—

Ammonia citrate of iron	1 part
Water	5 parts
Ferricyanide of potassium	1 part
Water	4 parts

Mix together in equal quantities.

I now come to the process for producing dark blue lines on a white ground. The advantages of this process are many. It can be worked in all weathers, and requires no dark room. Copies can be coloured and varnished, altered and corrected, and last, but not least, they do not *fade*.

There are five distinct operations, viz.:—(1st) Exposure in the printing frame, (2nd) Developing of copy in yellow prussiate solution, (3rd) Washing in first water tray, (4th) Bleaching in acidulated bath, (5th) Brushing and flushing in second water tray, and finally drying.

The glass in the printing frame should be very clean and bright. Place the drawing to be copied in the printing frame, and upon it a sheet of the sensitized paper, put the felt over all, and smooth outwards from the centre with both hands, close the frame, and expose to the light. The time of exposure varies with the season of the year, state of the atmosphere, and quality and intensity of the light. In the sunlight in summer it only requires a few seconds, in the shade a few minutes, but in foggy and dull weather in winter, half to three-quarters of an hour. The exposure can only be determined by constant practice, and test slips. The test slips should be placed in the printing frame alongside the tracing being copied. These small test slips are inserted so as to be about two-thirds inside and one third outside the frame at the back. They can then be conveniently drawn out without opening or disturbing the print. The frame must be exposed to the direct action of the light, and no shadow allowed to fall on it. After a time, one of the test slips is drawn out, and dipped in the prussiate solution, and its chemical action watched for, from 40 to 50 seconds. Should the background remain perfectly yellow, and the lines come out blue, the exposure has been sufficient. During the testing the

* Abstract of a paper read before the Derby Photographic Society.

frame must be turned face downwards, or otherwise screened from the light.

It is not necessary to develop the copies immediately after exposure, therefore all the printing might be done while the light is strongest, leaving the development until the evening or the following day. After exposure, the copy should be placed face downwards on a board, and the edges turned up carefully, so as to form a sort of tray, three-quarter inch in depth. This renders the sheet more easy of manipulation, and leaves the back white when developed in the prussiate bath. The copy is now placed face downwards, and floated on the prussiate bath for about thirty seconds. The operator should see that uniform contact takes place everywhere while in this solution; raise the copy, inclining it to allow the solution to drip off one corner, then particularly notice how the lines seem to stand out. If they stand out, and the ground remains perfectly yellow, the development may be considered complete.

After development, the copy is floated or immersed in the first water bath, in order to check the further action of the prussiate, and then immersed face upwards in the acid bath, care being taken that the entire copy, both front and back, is saturated. In winter, the copies can be safely left immersed in the acid bath ten minutes or more; in hot weather three or four minutes may suffice. The surface of the copy should be worked all over carefully with a soft brush to start and loosen the blue mucilage.

The copy is next placed face upwards in the empty second water tray, and again well brushed to get rid of the superficial mucilage.

Finally it is flushed copiously with clean water, both front and back, so as to remove all traces of the previous chemical solution. For drying, lay the copies across semi-circular rollers about three inches in diameter.

Any blue stains on the copies may be removed, or alterations made by the use of the blue solving supplied with the paper; any blue stains on the hands may be quickly removed by a very weak dilution of caustic potash.

It is essential that the contents of the two chemical baths do not get mixed, or blue stains will appear. To prevent this, it is advisable to well rinse one's hands in clean water after each operation.

WITH THE BRITISH ASSOCIATION.

BY R. G. BROOK.*

THINKING that the members of this section would like to hear something of my photographic experiences during my recent journey to the Rocky Mountains, and amongst the marvels of that natural wonderland called "Yellow-Stone Park," I have jotted down the following notes. Before starting, I provided myself with one of Watson and Son's complete tourist's sets, including whole-plate camera with double swing-back, double action front, and three double dark slides; the whole fitted with a Ross rapid symmetrical lens, and packed in a solid leather case. I also took out nine dozen Fry's ordinary dry plates, three dozen special instantaneous, for drop-shutter exposures; a bottle of Fry's developer in order to bring out a plate or two by the way, to see how I was getting on; and two ebonite developing trays. Not a very bulky outfit, and I little thought, as the good ship *Parisian* steamed majestically out of the river Mersey, that the work I had before me would be so laborious, and the extra cost of travelling with a whole plate camera and twelve dozen dry plates as luggage, so formidable as subsequent events proved.

In the first place, I had only one ruby lamp, the glass of which got speedily smashed. Every one who takes a ruby lamp to sea should take also two or three extra glasses; but I would not take a lamp again, as I found that a couple of sheets of red paper (given to me by Mr. Watkins, the well-known photographer of San Francisco, whom I met with in Yellow Stone Park) put round a candle, answered perfectly, and carried me over the remainder of my tour.

In the next place, travelling photographers in a rough country should always take two or three extra squares of ground glass for focussing. I found it exceedingly awkward, when my camera was blown over and the focussing-glass shattered, to discover that the nearest glass shop was a thousand miles away.

I also found the want of a few small screws to fit the brass work of the camera; a want, the reality of which you will readily appreciate as I describe some incidents of my journey.

My ebonite trays were broken before I reached Montreal so I left my bottle of developer with Mr. Notman of that, city. I had exposed two plates on the voyage out, and the gentleman to whom I sent them to be developed spoiled one, but luckily sent for me before he tried the other. Here the Fry's developer came in, and the second plate came out all right. I left it to be washed and dried, but, on arriving home, I found that he had not half washed it, and had covered it with some rough composition intended for varnish; this covering turned a dead white, and was gradually destroying the film. I showed it to our chairman, Mr. Heather, who advised me to get another negative from it immediately, which I did, he also taking one. These negatives are better than the originals.

Besides these two plates, I tried several experiments during the passage across the Atlantic. I hoped and intended during the voyage to get a photo. of a rough sea, and on August 21st made my first attempt. It was blowing what I considered a gale, the waves being, if not exactly mountainous, at any rate considerably high; one man was holding on to each leg of the camera stand, another held me while I steadied the camera. I only wish some one had photographed the group—it would have formed a capital subject for a lantern transparency. But, notwithstanding all our efforts, the picture has not turned out very successful; indeed, I am sorry to say that most of my drop-shutter exposures have not turned out well, the shutter not being quick enough.

On sighting Belle Isle, we passed close to two fine icebergs. I expended a couple of plates on them, neither of which proved very satisfactory, partly because on this occasion I was prevented from getting a good shot at my object by the passengers crowding in front of the camera. I found, too, a difficulty in getting a dark-room on board ship in which to change the plates. The lamps are lighted all night in the passages, and the light comes over the top of the berths, so that I had to get a friend who occupied the berth above to hold his blanket over me while I changed the plates. However, through all the difficulties I succeeded in taking a group, including Lord Rayleigh, Lord Ross, Sir Frederick Bramwell, and thirty-six other members of the British Association, on the two plates already referred to as being developed at Montreal.

On arriving at Quebec, a party consisting of three friends and myself drove over to the Montmorenci Falls, where I exposed a plate from the wooden bridge across the river; my friends being stationed on the adjoining rocks. I then devoted two plates on the Falls themselves, and all three exposures have been successful. A little incident occurred here worth noting. While taking the Falls from the opposite bank on the edge of a precipice, the wind blew my instantaneous shutter off, and carried it a few yards down the side, which necessitated me scrambling after it, a somewhat dangerous operation, for had I slipped, the remains of R. G. Brook, supposing any to have been found, would have had to be returned in a box.

At Montreal we sojourned for a week, and here I found staying at the same hotel, Mr. Henderson, of London, and Mr. York, who came over in the *Parisian*. I got three views of Montreal from the mountain, two others from the top of one of the towers of the Cathedral of Notre Dame, from whence a splendid birdseye view of the city is to be obtained, and one from the window of the hotel. I also got views of Montreal Cemetery and of the Luchine Rapids. All my Montreal plates came out well except those of the Rapids, which I spoiled in developing by getting hold of the wrong bottle—one result of having too many bottles about one in a dark-room.

(*To be continued.*)

* A communication to the St. Helen's Association.

HOME PORTRAITURE: LIGHTING, POSING, AND RETOUCHING.

BY T. N. ARMSTRONG.*

IT is generally thought that, without the aid of a studio, with its special advantages for lighting, &c., the amateur can have no chance alongside a professional photographer who possesses this benefit. Now, I am not one of those who think thus; on the contrary, I maintain, and hope to be able to demonstrate that there is no reason why an amateur should not produce quite as good results in portraiture as the professional.

In the first place, allow me to say that one of the chief errors amateurs fall into lies in using too strong a light. If, for instance, you place a sitter (say) about five feet from any ordinary window having a good northerly or north-westerly exposure, and step back and carefully observe the effect of the lighting on the face, you will at once see that the contrast from light to shade is too great; the side next the window is too light, while the off side is too dark. This is the result of a want of diffused light.

Diffusion of light may be divided into two classes:—1. Natural diffusion; and 2, artificial diffusion. Natural diffusion may be described as follows:—The atmosphere everywhere, and at all times, is filled with floating particles of matter, and all of these are more or less opaque. Those which are opaque reflect a portion of light and absorb a portion. Those that are transparent refract a portion and absorb a portion; this constant changing of the course of the rays until they are thrown in every conceivable direction is known as "diffusion"—that is, natural diffusion. When any translucent screen is made to intercept the direct rays of light, and the atoms of which the screen is composed reflect or refract the rays, so that those which come through have lost their general direction—some passing one way and some another—they are said to be "diffused." This is artificial diffusion. Natural diffusion is beyond our control; not so artificial diffusion. With it we have all to do, and we bring it to our aid. By it we soften high lights, break up too strong shadows, and give proper modulation and solidity to our image.

Now, to obtain artificial diffusion. Procure a muslin screen, like this. I make it myself, and it cost me about threepence. lens, in such a manner that all the rays of light which fall on the face must pass through the gauze. Step back again and take another look, when you will at once see that a very material change has taken place. Not only has the high light on the face been softened down, so to speak, but the dark side of the face will appear to have been lighted up, thus reducing the violent contrast which had previously existed. Now procure an ordinary clothes-horse, commonly used for drying clothes on, throw over it a white sheet, and so fold the divisions of it into such positions that a reflected light (not too much of it, mind) just increases the light on the darkest part of the shaded side, and at the same time throws a little front light on the face, so as to soften or blend the high light into the shade, taking care to preserve some light and shade, which is the soul of portraiture, as well as other branches of our art. This done, your subject should be well lighted, which may be ascertained by seeing that the catch-lights are the same on both eyes.

If you examine the specimens I have brought with me to-night you will find at least four entirely different styles of lighting. No. 1 is an example of the Rembrandt style, and is a picture of my little girl. She was placed about four feet from the window with her side to it, so I moved my camera, as it were, into the middle of the room, and pointed against the light. No. 2 is an example of three-quarter lighting. The sitter was placed about five feet from the window and almost facing the glass, and then the head was just turned round until only a dash of light fell on the off cheek. In this case the camera was placed so that the lens pointed from the source of light on to the sitter—almost the reverse of the Rembrandt style. No. 3 is a style very popular with Americans. In this instance the sitter, as it were, turned the head away from the light, so that the light came from the direction of behind the ear, thus giving a full side view with the off cheek in shadow. Another pleasant way is to place the sitter so that the light falls on the cheek next the window, the off cheek being in shadow. A full face is obtained by this means.

You will thus see that the amateur is not tied down to any one style of lighting, but that he has quite a choice; so he may exercise his discretion in choosing this or that one as most suitable to the requirements of his various sitters. Can more than this be obtained in any studio? I think not.

Having said so much about lighting, I now come more particularly to the subjects we are specially to consider, in which later on I hope to give some practical demonstration, namely, retouching and enamelling. No matter how well and artistically you may light your subject (passing over the consideration of proper exposure, development, printing, toning, &c., with which, no doubt, you are all conversant, unless the amateur be able to retouch his negatives and then to finish his prints in a superior style, he will still be far behind the professional.

I have brought with me tonight some prints which I propose to enamel. They are here soaking in cold water. I have also beside me my glasses, upon which I shall place the prints later on. Now the first thing to do is to thoroughly clean and polish these glass plates. You will see me clean them with the ordinary plate-cleaning powder. Next you will see me rub the plates with this little bag of talc; then you well see me take a camel's-hair brush and dust them, and then you will see me take a small brush dipped in albumen (white of egg) and go round the edges of the glass plates, and when done they are set aside for the albumen to dry. When this has taken place, I take a bottle of collodion, coat each plate with the collodion, and again set aside to dry; while this is being done, I get ready my gelatine. I take two ounces of it and soak in clean cold water. The cold water is then drained off, and hot water applied to melt it; the quantity necessary for the two ounces of gelatine will be about eighteen ounces. When the gelatine is melted, I pass it through muslin into a flat dish. I have my gelatine ready so prepared, which I now place into a metal dish containing hot water to keep the gelatine warm.

When the plates are well set, I place my prints into the warm gelatine, and make sure they are thoroughly saturated. I then take them out one by one, rapidly place them on the collodionized plate, and lightly squeegee them on. The plates are then placed aside for a short time, and, finally, I give the prints a backing by placing on them cardboard, which is a very easy matter. I simply take the cardboard, soak it in water, and place between blotting-paper to absorb the spare moisture, and then, with a coating of gelatine, starch, glue, or paste, I press well into contact, and the thing is done. Now, the only difficult part of the operation is the collodionizing of the plate. Those of you who are familiar with the wet process will have no difficulty, while to those of you who have only worked dry plates, I say—do it coolly and deliberately, and with a little practice you will be able to coat a plate without spilling a drop. Let me, however, give you this word of caution:—Take care not to go too near a light with your collodion, or you will have a "jolly fine" blaze all round. The plates with the prints attached are then placed away to dry. I find a very good way is to dry them at a reasonable distance from an ordinary fire (not too near). They may then be left on the mantel-shelf all night, and in the morning they will be dry and ready to be removed from the glasses.

(To be continued.)

* Abstract of a paper communicated to the Glasgow and West of Scotland Amateur Photographic Association.

Patent Intelligence.

Applications for Letters Patent.

16,087. CHARLES SANDS and JOHN JAMES HUNTER, 53, Chancery Lane, London, W.C., for "Improvements in photographic cameras."—Dated 6th December, 1884.

15,887. WILLIAM MIDDLEMISS, Holmefield Mill, Thornton Road, Bradford, Yorkshire, for "Improvements in photographic cameras."—Dated 3rd December, 1884.

Specification published during the week.

1251. GEORGE RYDILL, of 52, Chancery Lane, in the County of Middlesex, for "Improvements of treating photographic transparencies or transfers so as to represent stained glass."—Dated 11th January, 1884.

The patentee appears to claim the process of cementing photographs on glass after the fashion of the so-called "crystoleum" process. The following is the definite or claiming clause of a long specification:—

The method of mounting photographic transparencies or transfers in connection with coloured transparent or translucent films and coloured glass, the whole being protected by sheets of glass, substantially as hereinbefore described.

Patents Granted in America.

308,468. Walter Clark, New York, N.Y., "Photographic Camera." Filed May 7, 1884.—(No model).

308,469. Walter Clark, New York, N.Y., "Photographic Camera." Filed Aug. 8, 1883. Renewed Aug. 14, 1884. (No model).

Particulars of both the above, with the illustrative drawings, will be given next week.

DEVELOPERS AND DEVELOPMENT.

BY ALFRED GUTHRIE.*

There are many developers and many modes of using the same developer. Some allow a rapid, and others a slow mode of working. Some like to use a rapid developer, and to get freedom from stain or fog (and with some plates this is necessary); others slow, so as to have more control over results. Each is good in its way, and excellent results may be got in either direction, but much depends upon the nature of the subject.

As to which is the best formula, or whether slow or rapid development is the correct thing, I am not able to say. There is no doubt but what a rapid-working developer is best or most suitable for portraiture in the professional photographer's hands, as it would be annoying and costly to have to keep customers waiting so long after each exposure till the operator could report upon the result and allow the sitter to depart. As far as the amateur is concerned, medium or slow development is, or I think should be, the most suitable, as it enables him to have more command over his plate. There are times, however, when rapid working would yield better results.

The professional photographer, working constantly with his apparatus and plates, can always estimate correctly, or, at least, within very narrow limits, what is the correct exposure to be given, and either rapid or slow development will give satisfactory results; but the amateur has necessarily a haphazard mode of guessing his exposure, and the result may be a very wide margin on either side of the correct one. In this case, slow development will give him more chance of correcting either over- or under-exposure. Again, there are some plates that will only yield fair results with very slow development, and if hurried in any way will only give ghosts of what they should be. Other plates will not give good results with slow development. Of course, if it were possible to get one good developer which would act equally well with all makes of plates, it would be a great step in advance, but I fear that cannot be.

During the last few years, there has been a constant stream of new developers, or modifications of old ones. The pyro, ammonia, and bromide have branched off into endless combinations—Edwards's, with glycerine and alcohol; Nelson's, with sugar; and Berkeley's, with sulphite of soda and citric acid. Then there is the soda developer, the potash, and the combination of both. We have the ferrous-oxalate, the hydrokinone, and now we are threatened with a new one with a regular jaw-breaker of a name which I am almost afraid to try and pronounce—hydroxylamine—hydrochlorate, and caustic soda. There is an endless variation in the proportions of the ingredients, and, of course, each one is best.

There is no use to lay down formal rules for development, for no hard-and-fast line can be drawn. Though formulæ are given, it is impossible to use them always in the proportions mentioned, even supposing the exposures to be correctly timed. There are so many cases in which a little more or a little less of any one or more of the ingredients is required to bring about the best result. You cannot take any formula as given by any plate-maker and adhere to it for all subjects—that is, if you want to make the most of the plates. We all know that pyro gives density; ammonia, soda, or potash (whichever is used), detail; while bromide restrains and keeps the shadows clear; but that is not all, for you must have a knowledge of how to proportion them so as to give the best results for each class of subject.

There are very few plates in the market but what will develop with any of the standard formulæ, if only they are watched and studied in the proportion of the ingredients; and there are very few photographers, professional or amateurs, who do not have a favourite formula—one which seems to give better results in their hands than any of the others. I have my favourite—1. Ferrous oxalate; and 2, the pyro and potash, though I very often use the sulphite of soda and ammonia developer. I think the best for amateurs is neutral oxalate of potash (saturated solution), protosulphate of iron (saturated solution), to which added one drop of sulphuric acid to each four ounces of solution, and used in the proportion of one to three. I find this developer gives good results with almost all makes of plates, and is very much under control. Any strength of negative can be made if the exposure be correct, the shadows clear and full of detail, and the high-lights perfectly dense. If the plates are over-exposed, a very small addition of bromide of potassium will give perfect command of the result, while, if the plate has been under-exposed and will not come up with sufficient density and detail, one or two drops of a one-per-cent. solution of hypo-sulphite of soda will do all that can be desired.

In all cases correct exposure will give the best results, but should there be, through any cause, much under or over-exposure, this developer will afford as good, if not better, results than any other that I have yet tried. Many plates can be developed in the same developer; and if it be returned to a stock bottle and exposed to sunlight for a short time it will recover its power to a great extent, and is preferred to newly-mixed developer for giving softness of detail. Another developer, for which I have a soft side, is the potash developer. It is an excellent developer for some plates which, with ordinary developer (pyro and ammonia), give red or grey fog. What I mean by grey fog is the negative having the appearance, when looked at by reflected light, of not being properly fixed—having a grey or yellow appearance all over it. When looked at by transmitted light it only seems slightly filled up in the shadows; but in most cases this developer will be found to give absolute clearness in the shadows.

There are some makes of plates, however, which do not work up in a satisfactory manner, the negative being weak in contrast. When this is the result (not from over-exposure) one or two drops of a weak solution of ammonia will usually give it all the energy needed. Another very handy developer, and one which I usually keep beside me, is the ordinary pyrosulphite of soda and ammonia. This I always use when copying anything, such as engravings from books. It is a very nice working developer, and though, in most cases, I prefer either of the developers I have named, yet this one is excellent. Either of these developers can be used over and over again till exhausted, and the results are equally good till the developer is exhausted—having no tendency to stain the film—and the colours of the resulting negatives are good for giving rich prints with plenty of contrast.

I have tried almost all the developers as they have appeared in the photographic journals from time to time (not that I was dissatisfied and intended to change, but just to see the effect), hydrokinone and hydroxylamine alone excepted.

(*To be continued.*)

* Abstract of a communication to the Dundee and East of Scotland Photographic Association.

Notes.

Under the Presidency of Mr. Ackland, the South London Photographic Society takes a new lease of life. At the meeting on Thursday last, not one hand was held up in support of the suggestion to dissolve the Society.

That Mr. Ackland should be President is most fitting, as he is actually the oldest member, and has been a steady supporter of the Association during the whole time of its existence.

The story of the origin of the South London Photographic Society has not yet been published, and here it is.

In April, 1859, Mr. A. H. Wall inserted an advertisment in the Photographic News, requesting such persons as were desirous of assisting in the formation of a new photographic society to meet him on a specified evening at the Walworth Literary Institution. Mr. W. Ackland was the only gentleman who responded; but, notwithstanding this,

the resolution to form the new society was formally proposed, seconded, and passed unanimously; as, when Mr. Wall found how things stood, he made a meeting by asking those gentlemen who were in the reading room to come and hold up their hands and express approval when the formation of a new photographic society was suggested.

In May, another meeting was held, and the Society was formally constituted in accordance with a resolution of Mr. G. Shadbolt; and a committee, consisting of Messrs. Ackland, Cotton, Harvie, Howard, Lake, and Wall was elected.

"Adventures in the Air," is the title of Mr. Cecil V. Shadbolt's new lantern lecture. It will be illustrated with some fifty slides, including Mr. Shadbolt's photographs taken in mid-air.

We learn that the Northampton Photographic Exhibition will be formally opened by a *soirée* on Wednesday, the 17th inst, and not on the 16th, as previously announced. The exhibition will remain open to the public until January 10th, 1885.

If gelatino-bromide plates are long in drying, fog results; and if dried too quickly, blistering results: at any-rate, this is what Captain Abney said on Tuesday last, at the meeting of the Photographic Society.

"What, then, is the proper time for drying?" has been asked. "Neither less than eight hours, nor more than twenty-four," was the reply of Captain Abney; so a considerable margin is allowable.

It is not long since that, *apropos* to the "striking" portrait which had been obtained of a flash of lightning, we intimated that the carte of a whirlwind, and a cabinet of a monsoon, would soon be forthcoming. Photographic enterprise has already fulfilled our prediction, and, as many of our readers will have noticed, a most satisfactory likeness of a tornado has been received from America. This development of the new and wide field for photographic energy cannot be but useful. Thus, as it is, information of most of our big storms is cabled across the Atlantic; and if it will now be possible to hurry over reliable cartes of our coming visitors, we shall of course be in a position to identify them as they arrive, and act accordingly.

The portraits of the tornado in question are quite plain, it appears; which shows they were taken from nature. Had they been photographed at second-hand from the Yankee reporters' accounts, they would have been "very highly coloured!"

Our suggestion of last week in reference to portraits of oneself, mounted Christmas-card fashion, has shown us how nearly the idea has been carried out, and we have received several examples.

The best design for general effect is from the well-known surgeon and microscopist, Mr. Charters White. We have here an artistically-arranged bordering of ferns and grasses, a portrait group of Mr. White, together with his family; also a Christmas greeting worded as coming from the whole of those represented. The whole appears to be printed from one combination negative. Mr. Moffat, of Edinburgh, sends us cabinet portraits with "A Merry Xmas and Happy New Year," printed on the sensitive paper, apparently from a second negative; while Messrs. Adam and Scanlan, of Southampton, send us something of the same kind, but with the greeting lithographed on the mount. Last of all, we mention the series of really elegantly designed mounts for Christmas, New Year, and Birthday cards, which Messrs. England Brothers forward to us; it being intended that amateurs or professionals should mount their own pictures on them.

After all the talk about the loveliness to be seen, and possibly conversed with, at the Paris Beauty Show next month, it turns out that the exhibition will be one of photographs only! The judges will be the public, and each visitor will have a vote, which he will place in an urn at the door.

The public will be graciously allowed to purchase Messrs. Braun's photographs of the National Gallery pictures at 12s. each. Messrs. Braun have photographed two hundred and forty of the pictures, and anyone who wishes to have a complete set can do so for the sum of £144, so that there is "no reduction" on taking a quantity. This price puts the photographs beyond the reach of the ordinary public, who will have to content themselves with looking at them in the shop windows, unless the National Gallery authorities discover that English photographers may be entrusted with valuable pictures, and allow a fresh series of negatives to be made. What virtue there is in a monopoly, or in what respect the art education of a nation benefits therefrom, is difficult to see.

The generosity of the authorities to Messrs. Braun is almost unexampled. When they granted permission, it seems not to have occurred to them to demand that a set of the photographs should be the property of the Gallery, and it was not until Messrs. Braun had entered upon their work that this arrangement was made.

The first "Conference on the Picturesque" took place recently at a meeting of the Edinburgh Society. The merits and demerits of a number of pictures were freely discussed, and a profitable evening was spent. The example of the Edinburgh Society is worthy of imitation.

A writer in the Christmas number of one of the monthlies has attempted to build a story out of instantaneous photography. From a photographic point of view, the effort is not a very successful one. An amateur photographs a tomb in the design of a cross in a country churchyard, and on developing, discovers the head of a beautiful girl looking over one of the arms of the cross. As he saw

no one by the tombstone, he imagines he has taken the portrait of a ghost, and engages in a little psychical research. The result of the enquiry is, that the portrait is identified with the face of the lady who lies in the tomb. Subsequently, the mystery is cleared up, and the portrait settled to be that of the lady's daughter, who, visiting her mother's grave, was roused by the movements of the photographer, "looked over the arm, saw my camera, and saw, too, that I was unaware of her presence, and, not wishing to be seen, bent down her head quickly." The whole business is supposed by the writer to be dependent upon the quickness of exposure, for, as he remarks, "the impression is taken literally *instantly*"—the italics are his. If so, we have to suppose the head is not only popped up at the exact instant of exposure, but popped up with the speed of a drop shutter! What was the photographer about that, at the time of exposure, he never looked at the object he was photographing? Surely he was a very careless operator!

In issuing a weekly illustrated journal of patented inventions, the English Patent Office has followed the lead of the United States Patent Department; but the English journal is, in every respect, far behind the American.

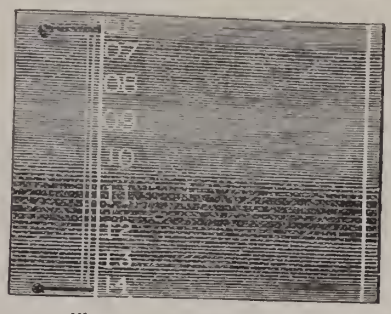
Some time ago we expressed regret that the negatives of the late Mr. O. G. Rejlander were not, after his death, purchased by some responsible person. As the pioneer of art photography, Mr. Rejlander deserved a better fate than having his studies exhibited side by side with portraits of half-dressed women, as bad from the point of art as from the point of decency. At the present time, in a shop-window not far from the Strand, may be seen a dozen or more of Rejlander's pictures, which were evidently trials, and never would have been shown by the artist himself. It is bad enough to have one's triumphs degraded by being associated with objectionable companions; but it is worse when one's failures are thus exhibited. No doubt there were circumstances which compelled the sale of Rejlander's negatives, but it is a thousand pities they could not have been weeded out before being sold.

A photographic artist lately wrote to one of the most popular occupants of the judicial bench, enclosing the recipes of three various preparations for coating paper with, and asking him to please select the best, adding that he sought his lordship's opinion with confidence, having always heard he was such an admirable "judge of a-'size.'" This libel on our profession appeared, need we add, in a so-called comic journal.

GORHAM'S PUPIL PHOTOMETER.

This beautiful and most ingenious instrument, to which attention was first called by Mr. Tindall, is as simple as it appears to be effective. It consists of a piece of bronzed tubing about 1·9 inches long, and 1·5 inches in diameter, with one end closed by a disc, in which are a series of pairs of minute holes pierced on radii of the circle, and drilled with absolute accuracy at distances varying from ·05 inches to ·28 inches apart. A cap with a radial slot in it so narrow as only to leave one of these pairs of holes visible at a time rotates over the brass disc; and round the cylinder just below the edge of the cap the linear distance of each pair of holes is engraved exactly opposite to it. Our first figure represents the cap as seen when looking down on

to it. The pair of holes ·10 inches apart are shown as visible through the slot. Fig. 2 exhibits the tube as seen sideways, to show how the figures are engraved upon it. The instrument seems to have been originally devised by Mr. Gorham for measuring the diameter of the pupil of the eye under the stimulus of light of varying intensities. It is used by looking through the open end of the tube (the bottom in fig. below), when two discs of



light will be seen, like a double-star. The cap is turned until a pair of these discs appear which are precisely tangent, or just touch one another at their edges. Then may the diameter of the pupil be read off on the scale by mere inspection to ·01 inches. But this is by no means the only—or, in fact, the chief—use of Mr. Gorham's instrument, inasmuch as the magnitudes of the pupil really furnish the measures of the intensities of the lights under whose influence its diameter varies. Hence it may be used as a photometer; and for this purpose we proceed as follows:—We set a Sugg's standard candle at a distance of 1 foot from the eye, with a white surface (such as a sheet of foolscap paper) behind it, in a room otherwise totally dark. We now take the diameter of the pupil in the way just indicated, and read it off from the scale. Leaving the photometer intact, we substitute for the candle the source of light whose intensity we wish to measure, placing a white background behind it, as in the previous case. Suppose that it is a duplex lamp which replaces our original candle. If we regard this from a distance of 1 foot, as before, we shall find our two discs of light, so far from touching, will be pretty widely separated, and we must slowly retire from the lamp until the circles have expanded sufficiently to become tangent again; when, of course, the pupil will have regained its original dimensions, from the light falling upon it being of identical intensity with that of the candle. It only remains to measure the distance of the lamp from the eye in feet and decimals of a foot to find its illuminating power, which obviously will vary as the square of the distance; *i.e.*, if we have to retire to a distance of 4 feet the lamp must give the light of sixteen candles, and so on. In a foot-note to Mr. Tindall's recent letter, a doubt was expressed as to the efficiency of Dr. Gorham's invention as a *quantitative* light-measurer. In connection with this we may mention that, as a preliminary to penning this article, we have been experimenting with a candle and a small reading-lamp, the relative intensities of whose lights we measured in succession by Rumford's method and by the instrument we are describing. By the former mode of measurement we found that the lamp gave 7·1113 times the light of the candle; by the new photometer it came out 7·111. It would perhaps be idle to contend that no element of "fluke" entered into this extraordinary coincidence; but it may serve

to show with what minute accuracy the relative intensities of various illuminating agents can be measured by this most simple apparatus. The incipient user of it will find it politic to keep his unused eye open; as, if it be closed, and then opened while the photometer is being employed, the stimulus of the light on the freshly-exposed pupil will cause the one viewing the hole itself to contract sympathetically, and so derange the measurement.

HYDROXYLAMINE USED AS A DEVELOPING AGENT.

BY ARNOLD SPILLER.*

Nearly two months have elapsed since Herr Carl Egli and myself published in the Photographic News the suggestion to use hydroxylamine as a developing agent, and I take this earliest opportunity to communicate to the Society the results of my further experiments. As hydroxylamine, prior to our publication, had not been introduced into the photographer's laboratory, perhaps it will not be out of place if I describe briefly the properties and preparation of the compound under consideration.

Hydroxylamine was discovered by Lossen, when investigating the intermediary products of the reduction of nitric acid to ammonia. This compound, which is represented chemically by the symbol NH_3O, is formed on the ammonia type, by the replacement of one of the atoms of hydrogen by the hydroxyl radical HO, as is seen in the following graphical representations:—

Ammonia.	Hydroxylamine.
$N\begin{cases}H\\H\\H\end{cases}$	$N\begin{cases}OH\\H\\H\end{cases}$

Like ammonia, it is a strong base, capable of forming several salts. It has not yet been obtained in the free state, but it can easily be produced in an aqueous solution. It possesses the somewhat remarkable property of behaving both as an oxidizing and as a reducing agent. Perhaps no better example of its reducing action can be taken than the decomposition of silver bromide in the presence of caustic alkali, whereby metallic silver, alkaline bromide, and nitrous oxide or laughing gas are produced.

The reaction is represented by the following formula:—

$$2NH_3O+4AgBr+4NaOH=Ag4+3H_2O+4NaBr+N2O.$$

Another important fact in considering the properties of hydroxylamine, is that it does not absorb oxygen, even in the presence of alkali; thus, during the process of development, there need be no fear of the developing solution becoming decomposed from contact with the atmosphere.

The preparation of this compound has not received much attention from chemists, and thus the process generally adopted is the same as that originally proposed by the discoverer, namely, the reduction of nitric ether by tin and hydrochloric acid. When this method is resorted to, a large proportion of the hydroxylamine is converted into ammonia, and thus the yield is comparatively small. Dr. Divers has recently published in the *Journal of the Chemical Society* a series of experiments on the formation of hydroxylamine from nitric acid. This investigator finds that a large yield of the desired compound is obtained by the direct action of tin and hydrochloric acid on nitric acid; in one experiment, 87 per cent. of the nitric acid was converted into the base. It may be of interest to know that the hydrochloride, or hydrochlorate, is already in the market, but as this compound has hitherto only been used for scientific investigations, the price is at present rather high, and would debar the professional photographer from adopting this method in his every-day practice; but there is very little doubt that, should a demand arise, the substance could be produced at a reasonable price.

With this, as with other developers, there is some difficulty in prescribing a definite formula, but the following, which is a modification of one recently described in an editorial article of the Photographic News, may be taken, I think, as a fair standard, and has given excellent results with certain brands of plates.

The following solutions are required:—

A.	Hydroxylamine hydrochloride ...	30 grains
	Alcohol	1 ounce
B.	Caustic potash	1 dram
	Water	1 ounce
C.	Potassium bromide	20 grains
	Water	1 ounce

The ingredients used are in principle similar to those employed with pyro. Caustic potash takes the place of ammonia, for the latter alkali is not sufficiently powerful to assist the reduction of silver bromide. The soluble bromide is used, as with pyro or oxalate, to restrain the action of the developer.

To develop a quarter plate with the above solutions take half a dram of A, 40 minims of B, and 10 minims of C, diluted to 1 ounce with water. The exposed film is plunged straight into the developer without previous moistening; the process proceeds rapidly, and is completed in about five minutes.

The advantages claimed for this developer are:—Wide latitude of exposure, non-deterioration of the solution from external sources, and absolute freedom from stain, a gain that cannot too strongly be accented, especially at this time of the year, when printing is so slow.

Against these important advantages I should state that there is a minor objection, and that is the liability to cause reticulation, with plates prepared with soft gelatine, from the softening of the film by the caustic alkali, and the evolution of the nitrous oxide gas from the decomposition of hydroxylamine.

This developer is particularly suitable for gelatino-bromide paper, for while the resulting tone is apparently identical with that obtained by ferrous oxalate, there is no after treatment with acid required to remove the brown stain which is so objectionable when the latter is employed.

Gelatino-chloride is very amenable to this developer, and by varying the alkali used, different tones are produced. Thus, potassium and sodium carbonates produce a sepia-brown tone; the same, but modified by the addition of a trace of ammonia, give a chocolate; and ammonia per se a brilliant purple.

A curious dichroic image is obtained with ammonia developer by reducing the alkali therein to one-fifth the normal amount, and exposing the plate about five-fold; the deposit, when moist, appears of a brilliant chestnut colour, which dries to a deep purple. This same purple image again appears as a brown in gas-light. My experience with gelatino-chloride is confined to only one make of plates, so that probably the tones would be somewhat modified when this developer is used with other brands; for Dr. Eder has already shown that films prepared according to various methods often yield different tones, even when the same developer is used.

For the development of gelatino-chloride films, the following solutions are required:—

D.—Hydroxylamine hydrochloride... ...	15 grains
Alcohol	1 ounce
E.—Potassium carbonate	6 drams
Water	1 ounce
F.—Ammonia ·880	1 dram
Water	1 ounce

A normal exposure for use with this developer is about ten minutes, one foot from a fish-tail burner. For a sepia-brown tone take half a dram of D, 40 minims of E, and 1 ounce of water. For chocolate tones the above mixture, to which has been added 1 minim of F. A purple image is obtained with half a dram of F and half a dram of D, diluted with 1 ounce of water. To obtain the dichroic tone, expose fivefold normal, and develop with half a dram of D, 6 minims of F to 1 ounce of water. The latter solution will probably prove useful for the development of gelatino-chloride prints, for I find that by backing a thin transparency of the dichroic kind with paper, a picture possessing a beautiful warm brown tone is obtained.

In advocating the hydroxylamine developer for gelatino-chloride, I claim freedom from stain, density of deposit, and variation of tone. It should be remarked that as the alkalies used are comparatively weak, no reticulation of the film is produced when the small proportion of alcohol included in the formula is used. In conclusion, I beg to express the hope that photographers will give hydroxylamine a fair trial, and communicate the results of their experience.

* Read before the Photographic Society of Great Britain.

Correspondence.

PROFESSOR THOMSON'S LECTURE ON PHOTOGRAPHY.

Dear Sir,—Will you kindly allow me to make a correction in your notice of my lecture on "Photography" to the Society of Chemical Industry, which I have just seen in the Photographic News of December 5th?

I am reported to have said that "the swing-back on cameras was in my opinion *only* of use in portraiture;" whereas I laid some considerable stress upon its great importance in architectural work. Again, in speaking of cherry fabric, I stated it to be preferable to glass only when travelling, on account of its greater portability.

Will you also allow me to point out that the word "large" in your report, with reference to microscope objectives, bears two interpretations. What I said was, that "with low powers up to a half-inch, the difference in chemical and visual focus is appreciable, but in powers higher than half-inch the difference is too small to be taken into account."—I remain, yours very truly,

JOHN M. THOMSON.

EXHIBITION AWARDS.

SIR,—Mr. Donkin's letter, replying to Mr. Smith on the recent lantern slide award, has *not* correctly stated the case. As Mr. Gale's slides were not on view anywhere in the Exhibition, as were the other slides, they could not come before the judges of awards with the other exhibits at the opening of the exhibition, as the prospectus implied they would. If they were received in time, why were they left out of the catalogue? Pictures at an exhibition are supposed to be on view the whole time it is open to the public, and to be catalogued. If Mr. West's and Mr. Robinson's pictures had been omitted in the same way, and had been kept shut up in boxes out of sight, as Mr. Gale's were, would they have been considered on view, and been awarded medals? In giving this award to one who was not in the competition, the judges have acted most dishonourably to the few who complied strictly with the regulations.—Yours truly,

P. H. FINCHAM.

Myton Road, West Dulwich.

[The tone of our correspondent's letter is to be regretted, as we are satisfied that the conditions of the prospectus were completely fulfilled in the case of Mr. Gale's slides. Mr. Fincham accuses Mr. Donkin of incorrectly stating the case, but mentions no instance of incorrectness. To accuse the Judges of acting dishonourably is ridiculous, and, moreover, inconsistent with another portion of Mr. Fincham's letter.—ED. P.N.]

LANTERN SLIDE CLUB.

DEAR SIR,—I read with interest the letter of Mr. Henry Smith in your last issue, on the above subject, and think it a capital idea. For some time past I have had a similar notion, that a society or club might be formed for the study of making lantern slides, and all matters connected with the lantern. The subject cannot be fully ventilated and discussed at the present existing societies, as there is no doubt that quite half, or perhaps more of the members, neither know nor care anything about either the lantern or lantern slides; and to such, the meetings on lantern matters would be very irksome. I therefore feel sure, with Mr. Smith, that a society of the kind is very much needed.

I should suggest that the society be open to all, and not confined to amateurs only; and, instead of buying the slides, let them be made by the members themselves. They could also contribute a certain number of slides annually, and there would be sure to spring up a mutual exchange of slides between the members. It is well known for a fact that there are thousands of negatives stowed away in plate boxes that have, perhaps, never been used, that would make exquisite lantern slides.

I have no doubt a meeting room could be found somewhere central, so as to be convenient. During the winter months fortnightly meetings could be held, but that is purely a matter of detail; but I should suggest that at least two first-class lantern exhibitions should be given—say one at the commencement of the season, and one at the end—on the best possible scale, making either a small charge for admission, or a subscription just sufficient to cover expenses and no more. I think the matter very simple, and that it could be established without much difficulty. I should be very pleased to assist in such an undertaking.—Yours truly,

WM. BROOKS.

Reigate.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE ordinary meeting of this Society was held on Tuesday, the 9th inst., at the Gallery, 5A, Pall Mall East, Mr. JAMES GLAISHER F.R.S., President, in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members of the Society:—Messrs. Hugh F. McConnell, C. A. Fernley, and Brougham Yonng.

Capt. ABNEY, R.E., then read a paper on "Testing Gelatine for Emulsions." He commenced by saying that his remarks might be considered as notes rather than a paper. Most gelatine plate makers, he said, are aware of the variable amount of water absorbed by different samples of commercial gelatine, and which have an influence on the character of the film after it becomes set on the plate. All gelatines dried on glass expand more or less, and to test the difference of expansion he coated a series of plates with various gelatines in the market. When dry, these films were stripped off, and the areas measured accurately. The series embraced hard and soft gelatines soaked with water alone, also with ammonia, potassium, and sodium salts added. Soft gelatines showed the greater degree of expansion, although it occurred more or less with the hard samples. The potash mono-carbonate showed less expansion than the sodium. A table of percentages was then given, which will shortly appear. Deviating from the title of his paper, he said that someone had recently mentioned that a substratum of one of the silicates caused emulsion to flow over the plates as easily as collodion, and it had been recommended to wash the plates after flowing over this substratum, or difficulties would arise. He had experienced a little difficulty in using the silicate of potash, and tried washing; but now he found he could use it without, by applying a very thin coating, and wiping it off with swandown calico.

The CHAIRMAN having invited a discussion on Capt. Abney's paper,

Mr. W. BEDFORD enquired whether soft gelatines treated with chrome alum would be likely to expand.

Mr. LEON WARNERKE, after referring to the penetrating power of his new developer, said if he desired to stop frilling he should use alum; he did not use it quite in the same manner as usually recommended, but preferred adding a small quantity to the first water in which the emulsion is put to wash. This plan is very convenient in the summer, when the temperature is high, as it makes the gelatine crisp; it also prevents the gelatine absorbing as much water as under ordinary circumstances, and still retain its permeability. The addition of alum he found to diminish the time required for development.

Mr. W. K. BURTON asked the previous speaker what proportion of alum he used in washing.

Mr. WARNERKE: Not more than five per cent..

Mr. T. SEBASTIAN DAVIS thought expansion depended a good deal on the length of time occupied in drying the films. In his own experiments he found that when bromide of potassium remains in the film, decomposition takes place, and frilling results Mr. Davis then described certain experiments he was engaged on, wherein he found a soft gelatine occupied four or five days in drying, and a hard sample dried under similar conditions in less than forty-eight hours; evidence of blisters being discernible in the soft samples after twenty-four hours in the drying cupboard; patches were also visible.

Colonel STUART WORTLEY supposed Mr. Davis alluded to plates for experimental purposes, as surely ordinary plates would dry quicker than that. He (Col. Wortley) would not be satisfied with plates that took over twelve hours to dry.

Mr. WARNERKE remarked on the difference in the results obtained by various experimenters. When he dried plates in two or three hours, they would blister; but not so if ten or twelve hours were occupied.

Colonel STUART WORTLEY considered a plate should become quite surface-dry in twelve hours, when it could be thoroughly desiccated by heat.

Mr. W. ENGLAND said if a plate required over twelve hours to dry, then it would be more sensitive in the middle than the sides; he had often observed that.

Mr. J. SPILLER believed Mr. Warnerke had touched on an important subject in his remarks concerning alum. Ordinary glue, he said, is rendered hard in manufacture either with alum, or one of the metallic sulphates, such as zinc; it might well form a fitting subject for experimenters. They might get some of the metallic salts to harden gelatine enough to obtain a suitable quality without loss of sensitiveness.

Mr. W. E. DEBENHAM enquired of Mr. Spiller what amount an emulsion was likely to bear without injury?

Mr. SPILLER merely suggested the idea. The amount of zinc sulphate used was very small. Manufacturers employed it to prevent the destructive change which occurs in extremes of temperature, as in very cold or hot weather.

Colonel WORTLEY mentioned half per cent. as the quantity of zinc sulphate employed.

Captain ABNEY, in replying, said that when soft gelatine was artificially hardened, its expansive properties would be lessened materially. He should expect to get fog as well as frilling if he prolonged drying to the extent mentioned by Mr. Davis; a substratum would prevent the marks spoken of. Drying should not occupy less than eight hours, or more than twenty-four. Plates dried by means of alcohol will frill, and the reason is not difficult to find, seeing that the top stratum is unequally strained from the lower. Slow drying in the centre, spoken of by Mr. England as productive of greater sensitiveness, would appear to be favourable to slow drying. Zinc nitrate has a remarkable tanning action on gelatine, but with a proper sample of zinc bromide, a quicker emulsion may be made than with the potassium salt. An uncertainty exists in dealing with the zinc salts. Referring to Mr. Warnerke's remarks, he (Captain Abney) said that by using the ammonia process, the film became more permeable to the developer, and did not alter by expansion, so far as his experiments had gone.

The CHAIRMAN called for a vote of thanks to Capt. Abney, which was accorded.

Mr. J. GORDON (Dundee) showed an apparatus for washing prints. It is a tank, fitted with a series of trays, about twenty in number, covered with wire or net, having receptacles for the prints to lie in during washing, so that no two prints could possibly touch each other. By means of an automatic syphon arrangement known as "J. Sturrock's Patent" the tank could be filled and emptied as often as desired, ranging from one to twenty times per hour.

Mr. DEBENHAM had seen one of these washers in use at a friend's house, and he was very pleased with its performance. After the water was syphoned off, the trays were left thirty seconds to drain before the next supply reached them.

Col. STUART WORTLEY observed that wood frames absorbed hypo. pretty freely, and wire frames were likely to mark silver prints.

Capt. ABNEY said he had tried wire, and found markings in consequence.

Several other members having expressed their opinions on this subject,

The CHAIRMAN thanked Mr. Gordon for bringing the washing trough before the meeting, and asked the members to pass a vote of thanks to Mr. Gordon, which was accordingly done. He (the Chairman) made the usual announcement regarding the election of officers in February next, and the meeting was adjourned.

The next ordinary meeting takes place on Tuesday, Jan. 9th, 1885.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual general meeting of this Society was held on Thursday, the 4th inst., at the House of the Society of Arts, John Street, Adelphi, W.C., Mr. E. W. FOXLEE in the chair. The minutes of the previous meeting having been read and confirmed,

The CHAIRMAN pointed out that owing to causes beyond their control, the list of officers nominated at the November meeting was not sufficiently full for them to elect a full committee, and, at his suggestion, the meeting was now voted special as well as general, to receive further nominations, which were then handed in.

The report was then read by the Hon. Secretary (Mr. F. A. Bridge). It alluded to the great loss the Society had sustained during the year by the decease of the President, the Rev. F. F. Statham, Mr. Jabez Hughes, and Mr. H. Baden Pritchard, all of whom were staunch supporters of the Society. When the President's death was announced, it was thought by some that the Society should cease to exist; over seventy circulars were issued with a view of ascertaining the feeling of the members on this subject, and the Committee regret that the responses showed so little interest displayed by the members in the Society's welfare. In reference to the work of the Society, the January meeting was the usual lantern evening; Willesden paper formed the subject at the February meeting. In April the lantern polariscope was practically illustrated by Messrs. C. and F. Darker, and the other meetings were occupied with papers from Messrs. W. Aekland, E. Dunmore, Norman Macbeth, F.S.A., and an illustrated lecture on Florida, by Mr. J. Trail Taylor. The report was adopted.

The voting in respect of the pictures sent in for competition was deferred, owing to the number of notices of motion to be dealt with; ultimately it was decided to deal with it at a future meeting.

Mr. BRIDGE presented his report as Treasurer, which was adopted. The subscriptions amounted to £25 13s.—this sum, with £10 17s. 3d. balance from last year, brought the total to £36 10s. 3d. After paying the usual disbursements, the sum of £4 6s. 1d. remained to provide for the presentation prints.

Mr. BRIDGE said, in reference to continuing the Society, "Will it pay?" Out of seventy-six members who paid last year, about thirty-six have become scared. If they continued, they must have members to pay their way; and could they get them?

The CHAIRMAN considered that in addition to Mr. Bridge's requirements, they needed men who were willing to work for the Society.

Mr. E. DUNMORE: Do we understand that the future of the Society resolves itself on the question of finance.

Mr. BRIDGE said that was practically what it amounted to.

Mr. C. POIRSON advocated a continuance if enough members could be ensured to pay the expenses of the year.

Mr. A. COWAN thought the scarcity of meetings had brought the Society to this pass—a view he held long ago. Experimentalists who had anything of interest could not be expected to keep it back from the weekly meetings because they were members of this Society as well. If the Society became modernized, there was room for it.

Several letters and a telegram were read from members in favour of the Society's continuance, when the Chairman requested Mr. Cowan to move that "The South London Society do cease to exist."

Mr. H. TRUEMAN WOOD thought it better that a motion should be taken, and he would second it. His opinion was not favourable to the object of the motion, as there was plenty of room and work for the Society to do in a technical and higher scientific condition, brought about by the advance photography is making.

The CHAIRMAN having remarked on his long connection with the Society, and his unwillingness to preside on this occasion, formally put the motion, which was unsupported.

The next motion, proposed by Mr. W. K. Burton, and seconded by Mr. H. Trueman Wood, "That the name be changed to that of the "London Photographic Society," was also lost.

The motion to increase the number of the committee to twelve, and reduce the number of vice-presidents to three, was carried unanimously.

The following gentlemen were elected:—

President—Mr. W. Aekland.

Vice-Presidents—Messrs. T. Bolas, H. Trueman Wood, and F. York.

Committee—Messrs. T. M. Ayers, W. M. Ashman, W. K. Burton, W. Cobb, T. J. Collings, E. Dunmore, G. A. Garrett, J. A. Harrison, C. Hussey, Jun., C. Poirson, W. H. Prestwich, H. Wilmer.

Hon. Secretary and Treasurer—F. A. Bridge.

Upon motion, a hearty vote of thanks was given to the Society of Arts, coupled with the name of Mr. H. Trueman Wood.

After the usual vote of thanks to outgoing officers, it was announced that the lantern meeting will take place on Jan. 1st, 1885, and the annual dinner at the Holborn Restaurant, on Tuesday, the 16th inst.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATON.

AT the usual weekly meeting held on Thursday last, Mr. A. L. HENDERSON occupied the chair.

Mr. W. E. DEBENHAM, agreeably with a promise made at a

previous meeting, exhibited some vignetting frames of the kind he has used for many years. On the front of the printing frame were fastened two thicknesses of millboard from which the centres had been removed. A card with the required size of opening inserted between the millboards could be shifted at will very easily, and was adjusted to the negative, but was held quite firmly enough to prevent any displacement accidentally. The different sizes of openings used were cut out on a separate sheet of cardboard and numbered, for convenience in registering the negative in case of future orders. The method adopted for greater softness was by distance, the front of the camera in this case being built up, and the distance increased towards the top of the print. For double printing Mr. Debenham used two sheets of glass, one masked with paper except the vignette opening, the other with the opening masked; the print was registered against the inner frame. Mr. Debenham said he could speak from a long experience of these frames.

The Chairman used two sheets of glass attached to the front of the printing frame, having a piece of opaque linen between, adjustable with the required vignette opening.

Mr. Trinks suggested a ready and simple way of ensuring parallel rays continuously falling on the plate during printing: a length of cardboard bent in the centre to an angle 45°, one side being fixed to the printing frame—the frame being so placed that the shadow of the other or vertical side of the angle reached the end of its base; the shadows being kept stationary by moving the frame as required.

Mr. Prestwich had recently seen published a patent for taking vignetted portraits direct in the camera. He showed two vignetted photographs taken by him direct upwards of twenty years since.

The Chairman spoke in favour of wire gauze being placed between the sitter and the lens; this gave a peculiar softness to the picture which he thought was not obtainable by any other method.

Mr. Trinks remarked that in his experience of societies of this kind he had found it much better to act than make suggestions; he wished to give force to his remarks by offering a prize of five pounds to be competed for by members of the Association. He did not wish to indicate in what form or direction the competition was to take; this he left entirely to the members.

It was ultimately proposed by Mr. F. W. Hart, and seconded by Mr. J. J. Briginshaw, that the mattee should stand over until the 18th inst., when details of the competion could be discussed and arranged. Members not able to be present on that evening were invited to send their suggestions to the Secretary with regard to object of the competition on or before that date.

Mr. J. B. Wellington, with regard to the discussion of the previous week on "Bichloride of Mercury as an Antiseptic," had tried it on an emulsion, using half-a-grain to ten ounces of emulsion, and found the speed of the plate materially affected, showing only 9 on the sensitometer—the same emulsion with the bichloride of mercury usually reaching 18. The plates developed very clear, and with plenty of density.

In reply to a question from the Chairman,

Mr. Wellington said he developed the plates with pyro.

Mr. Trinks said the subject of decomposition of gelatine brought to his mind a fluid that some time since caused a great amount of interest in medical and microscopical circles; it was called Wickersheimer's fluid. Any skeleton or animal substance dipped in this fluid retained all its original softness and pliability. The fluid, he believed, among other things, contained arsenic—the preservation of the object, in his opinion, being mainly due to the action of this chemical. He (Mr. Trinks) had still in his possession some microscopical specimens preserved with this fluid.

Edinburgh Photographic Society.

The second meeting for the current session was held at the Society's rooms on Wednesday, 3rd December, Norman Macbeth, Esq., President, in the chair.

The minutes of the last meeting having been read and approved of, the following gentlemen were declared duly elected:—Messrs. W. A. Bryson, G. Napier, Chas. Murray, Aitken, W. Skinner, J. W. Miller, Henry Cowe, Herbert W. Bibbs, Robert Lindsay, Donald Mackenzie, and Alexander Thompson.

The report of the Council on the study of the picturesque was then submitted.

The Chairman, in submitting this report, stated that of course this was a mere experiment, and it was impossible to say yet how it would succeed. It was thought by some that it would be well to hang the pictures for criticism on the walls, but after consideration it had been decided that it would be better to hand the pictures round for examination individually, and after all had been examined, then to give the members an opportunity of being heard on their merits and defects.

A large number of pictures were then laid on the table and handed round for inspection, after which, when they were all returned, the Chairman called the attention of the members to a portrait of a lady. He said that, in the meantime, the names of the artists were to be withheld, so that members might freely express their opinions; afterwards he would, so far as he knew, inform the members of the names of the parties submitting the work.

The comprehension of the comments made upon the photographs would be so dependent upon the illustration afforded by the exhibition of the pictures themselves, that we omit them.

Mr. J. B. Readman then read "A Plea for a Workroom for the Use of Members,' for which a hearty vote of thanks was passed.

Mr. Bashford then exhibited to the meeting a shutter analogous to that of Reynolds and Bransom, of Leeds, by Mr. A. A. Pearson. After explaining its working, he handed it round for inspection by the members.

The Chairman called the attention of the members to the annual dinner of the Society, which had been fixed to take place on Friday, the 12th inst., at half-past six.

A vote of thanks to the Chairman closed the proceedings.

Derby Photographic Society.

The first annual meeting was held at the London Restaurant, Iron-gate, on Wednesday evening, Mr. Richard Keene occupying the chair. The minutes of the last monthly meeting having been read and confirmed, the following officers were re-elected for the year 1885:—

President—Captain W. de W. Abney, R.E., F.R.S.

Vice-Presidents—Messrs. C. E. Abney, B.A., H. A. Bemrose, M.A., R. Keene.

Committee—Messrs. J. Cox, James E. Kaye, Thomas Scotton.

Hon. Sec. and Treasurer—Mr. Fred. W. Simpson, Mill Hill.

The Hon. Secretary then read the annual report, which was unanimously adopted. The Committee, in presenting their first annual report, congratulated the Society on the successful start which it has made. Although the Society had only been in existence six months, the members on the books numbered twenty-eight. The indoor meetings had been very fairly attended, and papers had been read. The Committee regretted that the out-door meetings had not been so well attended, and trusted that they might be more successful during the coming season. Excursions had been made to Duffield and Matlock during the past season. The thanks of the Society were due to Captain Abney as President, and to the retiring office-bearers; to Mr. A. J. Cox, for his kindness in providing a room for committee meetings; and to the proprietors of the photographic journals for copies of their papers. The balance-sheet showed the financial position to be satisfactory.

A vote of thanks was passed to the Hon. Secretary (Mr. F. W. Simpson) for his services during the past year.

Mr. Thomas Scotton then read a paper on "The Photographic Processes used in Copying Drawings" (see page 788), which he illustrated by some exceedingly fine specimens of the various processes, those by Pellet's process certainly carrying off the palm.

Votes of thanks were passed to the Chairman and Mr. Scotton, and the meeting was brought to a close.

Dundee and East of Scotland Photographic Association.

The third monthly meeting for the winter session was held on Thursday, the 4th instant, in Lamb's Hotel, Dundee, when there were about fifty members present. Mr. J. C. Cox presided.

An exhibition committee was elected, and Mr. D. Ireland, jun., was chosen as honorary secretary to the Exhibition, the joint treasurers being Mr. John Robertson and Mr. V. C. Baird.

Mr. Alfred Guthrie then read a paper on "Developers and Development" (see page 791), detailing his experiences with the different formulæ.

A very hearty vote of thanks was awarded to Mr. Guthrie for his instructive communication.

The Society's lime-light lanterns were then put in operation,

and a large number of slides were shown, the exhibitors being Messrs. Valentine, Mathewson, Ireland, Lawdon, and Jones. With the exception of Messrs. Valentine and Lawdon's slides, most of the others were on gelatino-chloride plates, which are now being extensively used for this purpose. Mr. John W. Lawdon, assisted by the Hon. Secretery, presided at the lauterns, and a vote of thanks was passed to these gentlemen for their services.

The Treasurer (Mr. Robertson) showed some large transparencies on gelatino-chloride plates of his own preparation, and another member kindly sent two frames of West's instantaneous photographs for exhibition.

The meeting was then adjourned.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

A SPECIAL Board Meeting was held of the above Association on November 21, to consider an applicatiou for assistance, which was granted.

On December 3rd, at the usual Board Meeting at 181, Aldersgate Street, the minutes of the previous meeting having been read and confirmed, another application for assistance was brought forward, and after the consideration of the facts connected with the case, a grant was made.

Mr. W. T. Smith and Mr. J. G. Gibson were elected as members of the Association.

The Board considered the advisability of appointing local secretaries in large towns, and would be glad to hear from any person willing to act in that capacity.

After disposing of other business, the meeting adjourned until Jan. 7th, 1885.

HALIFAX PHOTOGRAPHIC SOCIETY.

THE usual monthly meetiug was held on Tuesday evening, Dec. 2nd, REV. W. E. HANCOCK, M.A., in the chair. The minutes of the last meetiug were confirmed, after which the following new members were elected :—Colonel Chas. Grove Edwards, Rev. J. W. Hall, Messrs. L. Hanson, Rowley, W. Simpson, T. Helliwell, and Jas Thos. Smithson.

Mr. F. MYATT, who was to have given a practical demonstration of emulsion making, having beeu called away unexpectedly, the President exhibited his new four-wick lantern, together with a number of slides made from his own negatives. The great brilliancy of the light was a matter of much surprise to all the members. For pictures up to six feet in diameter it seemed to compare favourably with the lime light. The slides were produced by the wet collodion process, and were of high-class quality.

It was decided to postpone the next meeting to Tuesday, January 14th, when the usual annual lime-light exhibition will be given, the Rev. W. E. Hancock operating with his bi-unial lantern, and all the slides used on the occasion to be the work of the members.

Mr. E. A. CAW suggested that there was a considerable number of amateurs who would like to join the Society, but were prevented from doing so from possibly a feeling of diffidence, or an exaggerated idea of their own shortcomings iu the art; and he thought the Society, to give encouragement to such, ought to have evenings set apart for the special edification of those just enteriug up in the study of the art.

Mr. THOS. ILLINGWORTH quite concurred, and thought it was a very hard struggle for an amateur to attain technical excellence in matters photographic unaided; he was prepared to lead the way by giving an elementary demonstratiou of developing.

Mr. W. CLEMENT WILLIAMS, without meaning any slight to the professional element, considered that there were very few, even of them, who could lay claim to any mentionable knowledge of photographic chemistry. He thought, therefore, it would prove to the benefit of all members if certain half-hours of these meetings were devoted to the study of this branch of chemistry.

Mr. Councillor SMITH always liked to know the why and wherefore of everything; he infinitely preferred dabbling and experimenting among his chemicals, even if at times it ended in failure, than to be content with simply purchasing his plates and developing by a rule-of-thumb formula. He would be glad to do all in his power to assist in carrying out the proposals of Mr. Williams.

The PRESIDENT was prepared to do all in his power to further such praiseworthy objects.

Mr. JOSEPH WHITELEY promised to give lessons in making paper negatives.

Mr. EDWARD GLEDHILL would give a demonstration of micro-photography.

Mr. W. CLEMENT WILLIAMS would contribute papers on the artistic printing of negatives, and composition and light and shade in landscape photography.

Messrs. Birtwhistle, Hancock, Smith, Bingley, and Jones were also willing to contribute papers, the subjects of which to be left for future settlement.

It was stated Mr. Middlemiss would attend at the next meeting to introduce his new patent camera, the President reporting very favourably of its merits.

A vote of thanks to the President for his lantern exhibition terminated the meeting.

ST. HELEN'S ASSOCIATION OF SCIENCE, LITERATURE, AND ART.

Photographic Section.

A MEETING of this Section was held on November 19th, at the Association Rooms, 4, Salisbury Street, Mr. HEATHER in the chair.

Mr. BROOK showed a large number of full-plate negatives of American scenery; and Mr. HEATHER a series of lantern slides made from these.

Mr. BROOK read a paper on "Experiences with the Camera with the British Association" (see page 789), illustrated by transparencies projected on the screen.

A hearty vote of thanks to Mr. Brook brought the meeting to a close.

BRADFORD AMATEUR PHOTOGRAPHIC SOCIETY.

THE monthly meeting was held on the 4th inst., in the Law Institute, the President, Mr. DUNCAN G. LAW, in the chair.

The minutes of the November meeting were read and confirmed.

Several 15 by 12 photographs of Yorkshire scenery were exhibited by Mr. Forsyth, including some shown in the Pall Mall Exhibition.

A new French head-rest was also brought forward by the Secretary; being of metal nickel plated it is very strong but light, and fixes to the back of an ordinary chair; it is very suitable, therefore, for taking portraits in ordinary rooms.

A new patent camera was shown by Mr. Middlemiss, this having double swing front and back, and many novel points in its construction, besides being portable.

LEEDS PHOTOGRAPHIC SOCIETY.

THE annual meeting was held on Thursday, December 4th, Dr. THORPE in the chair. After the confirmation of the minutes, and the adoption of the report, the meeting proceeded to the election of the Committee, as follows :—Messrs. Branson, Denham, Marshall, Ramsden, Reffitt, Rodwell, Teasdale, Thornton, Thorpe, and Warburton.

The meeting then proceeded to the consideration of the following exhibits:—Mr. J. W. Reffit—Enlarging apparatus; Mr. Branson—Photo-micrograph apparatus fitted with electric lamp, instantaneous shutters; Mr. Teasdale—Photo-micrograph apparatus, micro-photograph apparatus, shutters, sensitometer, view-meter, and photometer; Mr. Warburton—Bellows camera; Mr. Foster—12 by 10 McKellen's new treble patent camera; Mr. Pearson—A new and very portable camera, the 12 by 10 size folding to 2½-inch thickness; Mr. Thornton—Bladey's pocket slide, Emerson's head-rest, &c.

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting was held in their Rooms on 2nd of December, Mr. HUGH REID, President, in the chair.

After approval of minutes, the following new members were admitted:—Misses M. H. Thomson, A. L. Robertson, Rev. Thos. Sommerville, Messrs. C. W. Laing, W. F. Finlayson, W. H. Gowans, James Fleming, John Dore, W. H. Turner, James Watt, and Robert Dalglish.

The election of office-bearers was then proceeded with, the result being that Mr. W. Snell Henderson was elected Treasurer, and the following six gentlemen members of Council for 1885 :—Messrs. James Elder, C.E., William Goodwin, R. Cutting, A. B. Ovenstone, T. N. Armstrong, and Charles Coulson.

Mr. T. N. ARMSTRONG then read a paper on "Home Por-

traiture" (see page 790), showing how variety of posing and lighting could be obtained in an ordinary sitting room. He then gave a demonstration of enamelling and retouching, and turned out a number of very fine prints.

Dr. Parker moved a vote of thanks to Mr. Armstrong, and after some conversation about the exhibition, which opens in the Fine Art Galleries on the 17th inst., the meeting closed.

North Staffordshire Amateur Photographic Society.

The usual monthly meeting was held on Wednesday, Dec. 3rd, at the Mechanics' Institute, M. C. Alfieri, president, occupying the chair.

A number of photographs from various sources having been exhibited, for the purpose of selecting a presentation print for the year 1884, upon taking the vote of the members, it was found that a 12 by 10 photograph by Valentin, entitled "After the Storm," had secured the greatest number of votes; the requisite number of copies was therefore ordered to be obtained.

After general conversation upon various topics of photographic interest, the meeting terminated.

Bury Photographic and Arts Club Exhibition.

The second annual Exhibition and Conversazione of the above Club was closed on Saturday last, after having been open five days; it was highly successful, and met with the approval of the public. There were no less than 270 photographs, 20 paintings in oil, and 16 water colours, in addition to paintings on plaques, and crystoleum paintings, the works of the members, which were placed round the room. The majority of the photographs were highly creditable, showing great taste in the selection of the views..

Mr. F. Cooper, one of the vice-presidents of the Society, sent 20 views, which were excellent in every respect. They included views of the interior of Walmersley Church, some pretty scenes in the Lake and North Wales districts, an exceedingly effective bit of Simpson Clough, &c. Next in order of position were 16 photos., principally cabinet size, by Mr. C. H. Openshaw, one of the younger members. These were excellent, and included views of Prestwich Clough and other scenery in the immediate locality. Mr. F. W. Livsey contributed a very large collection (no less than 85) to the photographic portion of the exhibition. There were among this large collection 15 views of Loch Riden and the Kyles of Bute, 12 views taken in Niddesdale. Miss Rosa Scott sent seven capital photographs of local views. Mr. T. J. Hutchinson contributed an equal number, and Mr. T. Entwistle four of views near Whitfield. The photographs exhibited by Mr. J. Nelson were very good; he, like Mr. Livsey, had gone somewhat wide afield with his camera, although in the opposite direction. Mr. Livsey's favourite haunts appear to have been in North Britain, while Mr. Nelson had gone to the south to spots sacred to Shakespere and Amy Robsart. Mr. H. M. Dearden contributed 60 views of Welsh scenery, Prestwich Clough, and other objects of interest in the neighbourhood. Of the 30 pictures shown by Mr. Robert Grundy, jun., of Parkhills, many dealt with Welsh scenery, and were beautiful in their effects. Mr. Grundy appears to have travelled over a considerable district in that part with his camera.

On Tuesday evening a conversazione took place, when an excellent string band, under the leadership of Mr. H. Sedgwick, played a selection of music. An exhibition of some of the works of the members projected on to a large screen by the oxy-hydrogen lantern was presented by Mr. E. W. Mellor, and Mr. F. W. Livsey gave the descriptive explanations.

Mr. E. W. Mellor exhibited Beard's patent self-centreing slide carrier, which had been kindly lent by Messrs. Stewart, of London, and which met with the general approval of the members.

Talk in the Studio.

Gossip from the Journal of the Photographic Society.—With respect to the nomenclature of scientific apparatus, it would appear that the wave of knowledge becomes very slow as its circle progresses towards the outside public; therefore it will not create surprise, when at one of the Lantern nights at the Exhibition a question was asked as to whether the Optical Lantern was a new method of electric lighting.—Is it an instinct, or what is it, that animates large bodies of visitors to judge so rapidly of the merits of pictorial photography? Whatever it is, there is something startling in watching the actual recognition of gems; at once, and as it were without hesitation, the voice of the many proclaims the judgment of the right thing. This was curiously evident every evening during the Lantern exhibition, when, after silence, a rush of applause immediately followed the appearance on the screen of some well chosen view, or choice bit of artistic effect.—One curious phase of the Exhibition was the intense interest taken in the apparatus by those who knew something about the use of the various articles on the table. Everything new or novel was scrutinised and examined with an eagerness which evinced a determination upon the part of the explorers to avail themselves of such exceedingly valuable methods, or ways, for enabling them to produce pictures, possibly in advance of what they had hitherto done, with also a pleasing idea of something new to be attempted.

The Prize for Improvements in Practical Photography.—Those reading a recent note may have supposed that it was Mr. H. T. Anthony, whose death we had to record not long ago, who offered the prize of 500 dollars. This, however, was not the case, as the prize was offered by Mr. E. Anthony, who is, we are glad to state, alive and in good health.

Paper Gummed on Both Sides.—Paper in sheets, half of which are gummed on both sides, and the other half on one side, and divided into strips and squares of different sizes by perforations, like sheets of postage-stamps, are very convenient in many ways—the doubly-gummed answering for fixing drawings in books, labels on glass, &c.—*The Chicago Lithographer*.

Death of Mr. H. Nathaniel White.—We regret to hear that this gentleman expired on Sunday last, at his residence in Sydenham. He has long been known as an enthusiastic amateur, and he received several medals for his enamel pictures.

International Inventions Exhibition.—The applications for space have now all been examined by sub-committees of the Council, and a selection has been made of the most promising. The number of applications has been so great that it has been decided to limit very strictly the admissions in those classes which may be considered to have been fully represented in the Exhibitions of the present and of the past year. The Council will, therefore, be obliged to refuse many valuable exhibits in such classes as those relating to Food, Clothing, and Building Construction. It will even be a difficult matter to accommodate those which have been selected, and it is feared that the list will have to be still further reduced. As soon as possible, information will be sent to those who have applied for space; but the enormous number of applications, far in excess of what was expected, have made it impossible to do this up to the present. The Guarantee Fund now amounts to £48,280, a sum considerably in excess of that subscribed for the Health Exhibition, or for the Fisheries, the amount for the former being £26,518, and that for the latter £26,656.—*Journal of the Society of Arts*.

Annual Dinner of the Photographic Club.—On Wednesday last, the annual festival of the Club took place at Andertou's Hotel, Fleet Street, Mr. W. Ackland in the chair, and something like sixty gentlemen sat down. The usual festive toasts were duly honoured; but the event of the evening was the presentation of a silver ink-stand and gold pen to the Honorary Secretary, Mr. E. Dunmore, as a mark of recognition for his services ever since the Club was founded in 1870.

Gas Explosion in Cheapside.—An explosion of gas took place last week at the establishment of Mr. E. Wood, Optician and Photographer, of 74, Cheapside, and two assistants were seriously injured.

Gelatino-Brom-Chloride Paper for Small Pictures.—Messrs. Morgan and Kidd inform us that as long as ten months ago they manufactured an emulsion paper containing chloride with a little bromide, and found that when this is developed with a weak oxalate developer, prints with warm brown tones result; also that by using a gold bath, any tone ranging from brown to a decided purple can be obtained. In order to obtain a smooth surface the finished prints are squeegeed face downwards on glass, and stripped when dry; but if mounted in the usual way the lustre is lost, as in the case of ordinary Lambertype prints. As the result of practical experience, Messrs Morgan and Kidd recommend the following method of mounting. When the prints have been squeegeed on the glass plates, the back of the paper is starched or slightly gummed, the prints being stripped when dry, as in the previously mentioned case. They are now trimmed and

made to adhere to the mounts by slightly moistening the latter with a sponge, and passing print and mount through a rolling press. Under the circumstances a pleasing half-gloss is the result.

CHEMICAL ACTION OF LIGHT.—According to D. Amato, many reactions which are said to take place through the direct action of light are not due entirely to that cause, but light appears to act only under certain determinate conditions of temperature; consequently, there are limits of temperature within which light does not act chemically. A mixture of chlorine and hydrogen, cooled to —12° C., can be exposed to the direct rays of the sun for hours without combination taking place. Care, however, should be taken that the chlorine is not exposed to the sun's rays even for an instant before cooling, as insolation renders chlorine capable of combining with hydrogen even in the dark. Silver chloride, if cooled to —12° C., is not decomposed by the direct solar rays; but if allowed to get warm, decomposition sets in immediately. Paterno has already observed that chlorine and olifiant gas do not combine in diffused light if the temperature is low.

A WATERPROOF VARNISH FOR PAPER.—One part Damar resin, and 6 parts acetone are digested in a closed flask for two weeks, and the clear solution poured off. To this 4 parts of collodion are added, and the whole is allowed to clear by standing.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, December 17th, will be "Microscopic Photography." Demonstration by Mr. T. C. White.

To Correspondents.

*** We cannot undertake to return rejected communications.

PRIORY.—1. Very full directions for preparing and working with gelatino-chloride plates will be found on page 168 of our YEAR-BOOK for 1882; and if you wish to obtain rich brown tones, the ferrous-citrate developer should be used. Dissolve 600 parts of citric acid in 2,000 parts of water, and add enough ammonia to make the liquid very slightly alkaline; but if excess of ammonia should be added by mistake, it can be got rid of by evaporating the solution until the excess is driven off. Next dissolve 400 parts of citric acid in the solution, and add enough water to make the volume of the liquid equal to double the water first used. Make up the developer by mixing 90 vols. of the above ammonium citrate solution, 30 vols. of a solution made by dissolving one part of ferrous sulphate in three of water, and six vols. of a solution of one part of sodium chloride in thirty of water. 2. We know of nothing which is better in this particular case.

JOHN H. WILSON.—The method described on page 90 of Eder's "Modern Dry Plates" is all that you require, if care be taken to properly follow the instructions.

ANXIOUS.—1. The coating on the paper is gelatine, but we cannot tell you whether it was originally a bromide or a chloride paper. 2. Those you mention are excellent, and we know of none that surpass them. 3. Yes, see page vii. of the advertisement sheet of last week's NEWS.

R. D. B.—1. A metal guide or templet must be used, and it is our impression that these can be obtained from most dealers in photographic materials. 2. They are ordinarily stamped or punched. 3. Judean asphaltum 4 ounces, benzole 10 ounces, masticated rubber 30 grains; dissolve the rubber first.

SUBALTERN.—The pictures are fair average work; but, perhaps, not quite up to the style of pictures issued from the best London studios. We can neither mention one as being exceptionally good, nor find one which altogether merits the term of reproach to which you refer. 2. Such language is too strong. 3. Unless the hundred sitters have proved exceptionally good ones, we should regard the enterprise as more akin to failure than to a success. 4. Without knowing all the circumstances, it is impossible to judge.

H. MILES.—1. You will probably find one of 5 inches focus (No. 3) the most useful. An adapter could be made. 2. It is only better when an extremely wide angle is required. 3. Such a proceeding would be of no service; the objectionable material must be removed. 4. Not for some weeks.

W. GOONE.—When parts are prescribed, everything must be taken by weight; but you may take your quantities in any term you like.

THOS. W. COOKE.—We should not hesitate a moment in deciding for the instrument which you mention first.

NOVICE.—Cyanide carefully used is the best thing: but even the best thing seldom removes the stain without ruining the negatives. Be more careful in the future.

A POOR PHOTOGRAPHER.—It is much slower, but there is no other disadvantage.

A. H.—A solution of "chloride of lime," soured by the addition of a little acetic acid, will remove the stains. The remaining part of your letter concerns the publisher, and has been handed to him.

C. D.—If there is any amount of silver worth saving in it, you must resort to the process of cupellation; but it is not probable that there is enough to make it pay.

H. D.—The plano or concave side should be turned towards the object, but the disadvantage of using it reversed is not very extreme. We imagine, however, that your lens is so mounted that you can turn it either way.

F. N. BRIDGEWATER.—The work is very carelessly done, and we think you should ask for the value of the mounts which have been spoiled. Of course a firm is very much at the mercy of the servants in a case like this, but better supervision ought to be exercised. We return the specimens.

CRYSOS.—1. If the manufacturers will not tell you, you cannot expect us to; but our impression is that the peculiarity rests with the colouring matters used. 2. Yes, a weak alkaline solution will carry the action further; try one part of washing soda in fifty or sixty parts of water. Of course this must be used warm. 3. It seems as if the tissue had been allowed to dry too slowly.

LIME-LIGHT.—Such processes as you refer to are modifications of the original calotype method, and very fine results may be obtained. The best account of them is contained in Abney's "Instruction" (page 167 of the last edition).

J. WHITELAW.—We posted them in an envelope, but with no other address than the name of your town. Enquire at the Post Office.

A. F.—1. You can only reach them by advertising. 2. They are not articles of commerce, so you you must get them made to order, or manufacture them yourself.

H. LAMBERT.—Thanks; next week.

S. DOBSON.—1. Unless the paper is coated with a layer of partially insoluble gelatine, it will not answer your purpose, and you had better proceed as follows: Dissolve one part of a tolerably hard gelatine in ten parts of water, and stir in one-twentieth of a part of bichromate of potassium. Float thickish paper on this solution, and hang up in a light place to dry. 2. There appears to us no reason why you should not use it as ordinarily sold, for a trace of moisture is of no importance.

RETOUCHER.—It would be unwise to use it, as the action would continue after you had finished; indeed, the only satisfactory method is to actually scrape away a portion of the film.

'The Whittaker of the Photographer.'—*Chemical News.*

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THE PHOTOGRAPHIC NEWS.

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LIBRARY

CONTENTS.

FLOATING ALBUMENIZED PAPER.

THE nitrate of silver which is taken up from the sensitizing bath when albumenized paper is sensitized, serves three distinct purposes. In the first place, double decomposition takes place between it and the soluble chloride in the albumen, so as to form silver chloride in the film of albumen, and a soluble nitrate, which remains in the solution. The silver chloride is, as all know, the principal sensitive substance in the paper. There is, besides this, another, however, an organic compound formed by the decomposition of the albumen itself by nitrate of silver. The formation of this second compound is a second function of the nitrate of silver. The third is that of acting as a "sensitizer." The silver chloride darkens only slowly if there be no silver nitrate present, nor any other substance which will take the place of the silver nitrate to absorb the chlorine given off when the chloride of silver is reduced by light.

To estimate the quantity of nitrate of silver necessary to convert the soluble chloride in the albumen into silver chloride is easy enough, if one knows how the albumen was salted, and how much each sheet takes up.

According to a formula given in Hardwich's, each sheet of paper of the usual size, 17 inches by 22 inches, takes up with the albumen about 7 grains of ammonium chloride. To convert 7 grains of ammonium chloride into silver chloride requires, as nearly as possible, 22¼ grains of silver nitrate.

We know of no reliable data for the amount of silver nitrate used to produce the organic compound referred to, but from experiments we have made with albumenized paper, estimating the amount of silver nitrate necessary to convert the soluble chloride, noticing the quantity of silver nitrate taken from the bath, and the quantity afterwards recovered by thoroughly washing the paper—without exposing it to light—we conclude that the quantity is very small, probably not more than two or three grains to the sheet.

The quantity of free silver nitrate remaining in the paper after sensitizing may very easily be ascertained. It is only necessary, after sensitizing a sheet, to wash the free silver nitrate out of it with distilled water, and to estimate the quantity of it in the usual volumetric manner. From estimations made by ourselves on the lines indicated, we may say that the amount of silver nitrate remaining in the paper in excess after sensitizing, is fairly represented by the actual diminution in bulk of the printing bath. We mean that, for example, if three sheets of paper take up one ounce of a sixty-grain bath, there will remain in each sheet of paper twenty grains of free silver nitrate, the further nitrate required to produce the chloride of silver and organic compound serving only to weaken the remaining solution.

Taking Hardwich once more as an authority, we find that an average quantity of bath to be used up by a quire of paper is eight ounces; that is to say each sheet of paper removes one third of an ounce of fluid from the bath.

Our own experience would incline us to put this figure a little higher in ordinary circumstances; the quantity absorbed varies greatly with the paper. Thick paper naturally absorbs much more of the bath than thin paper does. Making an average, we should say that a quire of paper reduces the bath by about nine or ten ounces. Taking this quantity as correct, and supposing the bath to be a sixty-grain one, we find that almost precisely the same quantity of silver nitrate is taken up merely to form a chlorine absorber, as is used to form the important sensitive salt. This appears to be somewhat extravagant, and has been felt to be so for a long time. More than twenty years have elapsed since it was pointed out that the silver bath might be greatly reduced in strength if part of the silver nitrate were replaced by sodium nitrate, which would serve as well as the silver nitrate to coagulate the albumen of the film. Doubtless economy resulted; but somehow, so far as we know, the method was never very popular.

There are other methods of economizing, however, which ought to be taken notice of. It is well known to practical printers that it is a great advantage to have the albumenized paper damp before it is floated. The edges do not curl away from the bath in the aggravating manner that they do when the paper is dry, and air-bubbles are less likely to be formed. These advantages are fairly well known, but we do not think that it is known how great an absolute economy there is in using the paper as damp as is practical, this economy arising from the mere fact that much less of the nitrate of silver bath is absorbed by paper when it is damp than when it is dry. We were astonished to find how great an economy really results from the use of damp paper.

Some time ago we were working with a very highly albumenized and very thick paper which reduced the bulk of the bath very greatly. We noticed that the amount of bath absorbed varied with the dampness of the paper, and determined to find out the extent of the variation.

We first used the paper very dry—as dry as it was practicable to handle it. We discovered that each sheet reduced the bath by more than half a fluid ounce.

We next made the paper as damp as was possible without danger of softening the albumen. We now found that each sheet absorbed barely one-third of an ounce of bath. The prints given by the paper sensitized when damp were of quite as good quality as those got on that sensitized dry. The bath which we were using was a sixty-grain one, and we found the damping of the paper to result in the saving of quite 12 grains of silver nitrate per sheet, or not far short of 380 grains per quire.

Concerning the manner of damping the paper, a few words may be said.

It is a common plan to keep albumenized paper in a damp cellar. In fact, this course is often recommended by dealers in albumenized paper. Many have not a cellar damp enough at their command. Moreover, it is objectionable to store albumenized paper in a damp place. It should merely be placed in such, if such be available, a few days before it is to be used, which often involves some trouble.

Abney recommends that the steam from a boiling kettle be allowed to play on the paper a moment or two before it is sensitized.

The following is the plan we have ourselves adopted:—On the shelf of a cupboard which has but one, the albumenized paper is laid flat, the albumen sides of the sheets upwards. Half an hour before commencing to sensitize, a vessel of boiling water is placed on the bottom of the cupboard. There is room for the steam to pass up between the front edge of the shelf and the door of the cupboard. The water is replenished from time to time during working. The paper is thus kept very damp, and apart from the saving in silver effected, the comfort in working is greatly increased.

AT THE WHEEL: BY G. HADLEY.

Mr. Hadley, at any rate, shows that it is quite possible, by the aid of photography, to make an effective picture out of an every-day subject, and the little study which forms our supplement this week was much admired by the visitors to the Pall Mall Exhibition. As regards the making of the picture, Mr. Hadley says:—

"It is one of a series of pictures taken during a short visit to Whitby during August last, and the weather being too dull for distant views, I went down to the quay with my apparatus, when I was attracted first by a group of two women selling fish at a rude stall, and, thinking this a fit subject, I lost no time in securing it. A little further on I noticed a group of fishermen lounging on their smack. After exposing a plate on this second group, I went further up the quay and saw a coasting-lighter, which had just put in with a cargo of coals. This, I thought, would make a capital picture, but as the man who was actually at the wheel had not, to say the least, a very picturesque figure, I went back to group two, and asked one of the men to stand at the wheel of the lighter. This he at once consented to do, and having obtained permission to go on board, in a few moments I had my picture. The man evidently knew his work, and I had therefore no trouble in posing him, beyond telling him to advance his left foot and grasp the wheel firmly with his right hand in order to bring out the muscles of hand and forearm. Perhaps it is not necessary to say that he was already provided with a short pipe when I engaged him.

"Before closing this short notice, I should like to point out to my brother photographers the absolute necessity for cultivating *the faculty of observation*, without which success need not be looked for. Effective 'subjects' are by no means so rare as many seem to think, though perhaps the faculty of seeing them may be dormant; for instance, while exposing my plates on these 'Whitby subjects,' two photographers were looking on, and could not see anything worth taking.

"With regard to the development of the picture, I may say that it was developed with 'hydrokinone,' as indeed were all my other exhibits. In fact, I have used no other developer for negatives for nearly three years."

NORTHAMPTON PHOTOGRAPHIC EXHIBITION.

The committee intrusted with the organization of this Exhibition have reason to be satisfied with the result of their labours, for in response to their invitation a very large number of photographers throughout the Kingdom have contributed, and consequently the present Exhibition may be regarded as a thoroughly representative one. The spacious and well-lit gallery, forming part of the Guildhall buildings, has been lent for the purposes of the Exhibition, and is most admirably suited for the display of pictures; the general effect on entering the room being most satisfactory. The walls are well covered, and in addition several large screens are completely filled; moreover, a well-lit corridor is devoted to Platinotype pictures and examples of photo-mechanical printing. There are 630 numbers in the catalogue; and the average excellence of the work is unusually high, the proportion of really bad pictures being very small indeed. We shall not give a detailed account this week, and for the present we will merely mention the awards of the judges, which are as follows:—

Large Landscapes—Silver medal (315), T. M. Brownrigg; bronze (433), T. A. Green.

Small Landscapes—Silver medal (567), W. B. Berkeley; bronze (319), T. P. Gibson.

Large Portraits—Silver medal (136), R. Faulkner; bronze (138 and series), H. E. Mendelssohn; extra bronze (317), J. Lafayette.

Small Portraits—Bronze medal (537), W. Gillard; bronze (13 and 16), F. Greene.

Instantaneous Marine Views—Silver medal (328), West and Son; bronze (389), W. P. Marsh.

Instantaneous Views—Silver medal (439), W. Cobb; Bronze medal (425 and series), T. G. Whaite.

Interiors—Silver medal (449), E. Dunmore; Bronze medal (295), T. Fall.

Genre—Silver medal (103), A. Diston; Bronze medal (458), G. Hadley.

Enlargement—Silver medal (190 and series), H. Dixon.

Transparencies—Bronze medal (514), P. H. Fincham.

Local views—Bronze medal (203), C. Law.

Extra silver medal for Landscapes with figures (121 and series), H. P. Robinson.

Extra bronze for Marine Studies (358), Abel Lewis; (284), F. M. Sutcliffe.

Extra bronze for Still Life (65), Mrs. Glen Payne.

Extra bronze for Photo-Mechanical Prints (603 and series), R. Schuster.

Silver medal (339), H. A. H. Daniel.

The opening ceremony, presided over by Sir Henry Dryden, took place in the presence of a large number of persons.

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

The second Annual Exhibition opened in the Fine Art Galleries on Wednesday, the 17th. Marked improvement, both in quality and in the number of exhibits, was noticeable. The prizes were awarded, as before, by the votes of the members.

First-Class.—"Scenes on Loch Lomond," S. Murray; "Old Church, Roseneath," and other pictures, W. Goodwin; "Toll House" and other pictures, W. Goodwin; "Afternoon Milk," J. L. Coulson; "The Artists," Miss Thompson; "Swans," J. L. Coulson; "Washerwomen," Chas. C. Coulson; portraits, T. N. Armstrong; portrait, T. N. Armstrong; groups, A. J. W. Reid; groups, W. A. L. Peock; "Three Horses," A. J. W. Reid; "Animal Studies," R. T. Cochrane; "Reflection on the Cart," W. C. Hume; "Thermac of Caracalla," Wilfrid Smith.

Second-Class.—Alex. McDonald, A. B. Ovenstone, T. N. Armstrong, R. T. Cochrane, D. Pratt, J. C. Oliver, H. G. Gillespie, W. Lang, jun., Chas. C. Coulson, W. S. Anderson.

Amongst the non-competitive pictures the best were Mr. Parker's, Mr. Finlayson's, Mr. Prate's, Mr. Napier's, Mr. McDonald's, and some lovely specimens of large heads by Mr. Stewart.

MEISENBACH CO., LONDON.

G. HADLEY, COPYRIGHT.

"AT THE WHEEL."

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HINTS ON POSING AND THE MANAGEMENT OF THE SITTER.

BY H. P. ROBINSON.

Chapter IX.—Expression in Portraiture.

"Every man is as God made him, and oftentimes a great deal worse," said Sancho Panza; and, if we may judge by the productions of the majority of photographers, his opinion is singularly true. Let us not blind ourselves to the fact that ordinary photographs are very ordinary indeed. The dead level of good work has spread like a disease, and he is a very poor photographer who cannot take a passably good portrait—one that, seen by itself, would pass muster as real gold with the average unobservant person, but which would turn out mere tinsel when placed side by side with the work of a master. It would be difficult to at once tell what was the difference. An old friend of mine used to say that it was "That!" accompanying the word with a snap of the fingers, by which he meant to express that last touch by which genius carries its work just beyond the goal reached by mere talent—a mystery which it is impossible to explain, but which is felt in all art. In photographic portraiture it will be found to depend almost entirely on the expression of the face, aided by the attitude of the figure, which should be in keeping with the expression, and be easy and characteristic. To obtain the best expression, the photographer should be not only an art student, but a student of human nature. He should not only be able to pose his model in a graceful or appropriate position, to place him in an effective light, and to get a good technical negative of him, but, if he is to be the ideal photographer,

"That perfect monster which the world ne'er saw,"

he must be able to sum up his sitter at a first introduction, and determine at once, amongst other things, the expression which would best suit that face, and to work up to that expression during the usually brief interval that elapses between introduction and exposure.

Have you ever noticed, when you are about to take a portrait, and are endeavouring to call up an animated expression on the countenance of your sitter, what a dogged determination he sometimes has not to be beguiled out of the moody expression he has assumed? At last, when you have tried all the subtleties you know, you ask him, in desperation, if he has not got such a trifle as a smile with him. He immediately answers with a charming expression you long to secure, "Oh, no! when I smile in a photograph, I always grin." Here is another sample of a good model gone wrong through the stupidity of photographers. Many operators think that if they make their sitters smile—they don't care about the quality of the smile—they have done their duty in their own particular state of life, forgetting that many people look idiotic when their simpers and smiles are perpetuated. Others seem to think that all expression consists of gush, and wake up the features to an unnatural degree of intensity. The photographer should endeavour to represent his sitters as moderately calm ladies and gentleman; or, if they are not entitled to the courtesy title, then as decent men and women.

Some faces are beautiful in repose, hideous in movement. A broad laugh is often beautiful in nature, because of its evanescence; but it becomes intolerable when it is fixed on paper. But there is a look of animation, far short of a smile, which suits nearly all faces, and which is so permanently beautiful that it deserves to be printed in carbon or enamel.

John Gibson, the famous sculptor, considered a smile frivolous; but what would be undignified in sculpture may be proper to less severe modes of artistic expression. He says, in a letter to a friend:—"The fault of the portraits of the present age is, that every man is expected to look pleasant in his pictures. The old masters represent men thinking, and women tranquil; the Greeks the same. Therefore, the past race of portraits in paint and in marbl look more like a superior class of beings. How often have I heard the remark, "Oh! he looks too serious." But the expression that is meant to be permanent should be serious and calm."

This is true enough of the expressions of men, but I cannot help thinking that the cheerful expressions of ladies and children are their best, especially when they are educed with such art as to appear perfectly natural; indeed, some of the most delightful portraits of children represent them in a very happy frame of mind.

The quality necessary in a man to enable him to draw out the best expression is "a gift." It may be improved by education and practice, but it is not to be attained by those who have it not in their natures. The latter may do high-class work, but never that which electrifies. A fine work should always give that feeling of pleased surprise which sends a glow of pleasure through the frame. This is never obtained through the intervention of that photographer who has not the proper "music in his soul."

When a man goes to have his portrait taken, his mind will, consciously or unconsciously, dwell upon the ordeal he is to go through; he will think of how his coat fits, how he feels, and how he will look; it should be the business of the photographer to make him forget all this—and himself. The man's appearance is positively deteriorated by constant reference to self, and the consideration of how he looks when sitting for a portrait. Now what that phase conveys is exactly that which should be avoided. It is needless to tell photographers that one half their sitters think they know how to sit, and it is equally unnecessary to add that this knowing moiety are his worst sitters.

The kind of conversational treatment that would best suit every sitter must be left for each photographer to decide for himself.

Everything so much depends on such small things, that it would be difficult to say much about them without opening a wider subject than is here intended; but the photographer would find it would simplify his labour, and be a kind of aid to thought, if he made a rough classification of his sitters, such as those who are best let alone. These are those who are ordered to have their portraits taken by their friends, and do not care how it is done; they usually obey the photographer's directions without question, and their portraits are always natural. The nervous, who require very delicate treatment; those whom a bluff treatment would suit and those who claim the greatest show of respect; and, above all, those who "hate being photographed." These last-mentioned are the sort I like if I have time to deal with them properly. It makes one feel a professional pride to so work these difficult sitters that they shall feel that although they came to you with reluctance, they leave with regret. This, I find, is often the case with children. They will sometimes scream at being brought, and scream at being taken away. Then there is that much respected person who thinks he can teach you your business—the best way is to let him; it pleases him and doesn't hurt you.

A great deal of expression, and that of the most agreeable kind, may be produced by the action of the figure, as well as by the features. Appropriate action may give life and animation to a subject not otherwise attainable. A man would not look very happy if he held down his head, and tucked in his chin, smiled he never so pleasantly; while a very little animation in the features will have an agreeable effect if it is properly backed up and assisted by an animated turn of the head; but, at the same time, straining after expression must be avoided; the happy mean is what the judicious photographer should strive for and get.

Some photographers seem to do all they know to awe their sitters into their worst expressions. A lady who was recently sitting to me told me her experiences in getting her portrait taken in a well-known studio in London. An appointment was made beforehand. The door was opened by a man-servant in a gaudy livery. The lady was ushered up

stairs, and kept waiting for half an hour, with nothing to amuse her but the solemn grandeur of the place. In the studio there were three photographers to attend to her; one to work the camera, another to move furniture and place the head-rest, and a third in white kid gloves to take command of the posing. The two latter talked over the personal appearance of the sitter as if she was an unintelligent lay figure, which she says she felt she had become before the exposure commenced, and she looks like it in the print.

I cannot understand how it is possible to make a sitter feel at his ease if the operator has a lot of assistants to help him. Sitting for a portrait should be a matter for friendly intimacy between sitter and photographer, not a solemn ceremony.

Those who still look at photography with withering contempt—and some exist to the present day—just as it is thought that rare individuals of the plesiosaurus are yet to be found in the deep seas—complain that photography has no power to idealise; but if they had any knowledge of our mysteries they would know that it is no longer the truthful art it was when it was famous for having no mercy.

These critics take it as a foregone conclusion that a portrait should be idealised. The notion that the artist should invest his sitters with a grace not their own, seems never to have been doubted. Dr. Johnson said that it was one of the highest proofs of the genius of Reynolds that he contrived to give nobleness to the head of Goldsmith in his portrait, whose genial soul and fine intellect were not habited in a very dignified or handsome body. If Reynolds gave to Goldsmith a nobility of countenance which nature had denied, but which the painter conceived was more characteristic of the inner man than the actual presentment, then we have in the portrait Reynolds' conception of what Goldsmith ought to have looked like, and not the actual portrait of the man. If he merely depicted him at his best, happily catching the expression which lit up the face when it was aglow with some happy thought, then he did not give Goldsmith the noble look, but, with the true painter's skill, readily detected the noblest effect, and gave permanent form to a transient expression; he did what every photographer should try to do, and when he succeeds he may expect to hear the sitter's friends exclaim—

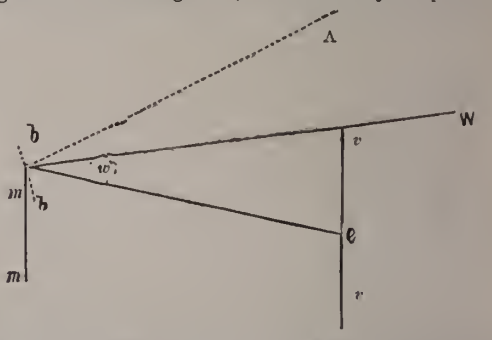
"Masterly done:
The very life seems warm upon the lips;
The fixture of the eye has motion in it,
And we are mocked by art."

AVOIDING REFLECTIONS AND GRANULARITY IN COPYING.

BY W. E. DEBENHAM.

In copying photographs and other pictures by the camera, the two chief difficulties that occur to those otherwise skilled in photographic manipulations, are the fogging or weakening of the shadows in parts, caused by reflections from the surface of the picture to be copied; and the granular appearance caused by photographing not only the picture itself, but the grain or irregularities of surface of the paper or other material upon which the picture has been produced. I have known a skilful operator—perhaps the most capable all-round portrait photographer as poser and manipulator combined that I ever knew—copy a photograph from which an enlargement had to be made, in such a light, that the irregularities of the paper of the original came out with so much strength and distinctness, as to require at least an extra day's time of artist's work in finishing the enlargement. Even then probably the resemblance to the original would not be so good as might have been the case, if the picture to be copied had been placed in favourable conditions of lighting. In this particular instance the original print was upon paper, the albumen surface of which had cracked all over, as was not unfrequently the case a few years ago, when very highly glazed surfaces were sought for.

In order to get at the principles which govern the occurrence or avoidance of interfering reflections when copying, let us take a case of a typical kind, and suppose that a mirror has to be so photographed, that the glass shall be represented by blackness, and the frame and any tracery, drawn (say) with French chalk here and there upon the glass, shall be represented in their proper form and gradations in the copy. This supposition is not a fanciful one, but actually represents very closely the copying of a Daguerreotype, and may be shown, though somewhat less obviously, to represent the copying of any picture where there are reflections to be avoided. It is assumed that the mirror is vertical to the direction of the camera. Well, an eye placed in the position of the lens will see itself reflected in the centre, and in the various other portions of the mirror will see those objects reflected whose images fall upon the mirror at the same angle as, but in the contrary direction to, lines drawn from the eye to each portion of the mirror. This fact is expressed in the well-known law of optics, that the angle of reflection is equal to the angle of incidence. Perhaps a diagram may help to make matters more clear. Let *m m* be a mirror, and *e* the eye of the observer, then if a window exists in the direction W, the eye will see itself in the centre of the mirror, about the centre of the face of the observer and at *w* an image of the window, together with the various other objects which fill up the intermediate space. All this in place of the blackness which the conditions assume as desirable and even necessary for the object required. The portion of the mirror where the image of the window is seen will appear so bright, that the chalk marks on the mirror, which were to represent light on a black background, will be dark by comparison.



Now let *v v* be a black velvet curtain, with a hole at *e* for the eye to look through; the pattern traced upon the mirror will show clearly against the black background of the velvet curtain. In order that this blackness may be more perfect, and not interfered with by reflections of the pile or folds of the velvet, or by the reflection of the eye looking through the hole, let there be no source of light in front of the curtain—that is, between the planes *m m* and, *v v* if both of them were extended infinitely—but let the light come from behind the plane of the curtain over its top and round its sides.

It will be noticed that the curtain *v*, *v*, must be of such dimensions that lines drawn from the eye to the extremities of the mirror, and returned at equal and opposite angles, shall fall within the surface of the curtain, therefore if the curtain be upon the same plane as the eye, it must be of at least double the dimensions of the mirror. In practice, the dark surface must be larger than this, and for the following reasons. The mirror is assumed, and may be considered to have a perfectly plane surface. The surfaces with which we have to deal are not perfectly plane; and although the deviations from flatness may be very small, they will be sufficient to require a certain allowance. These deviations are of two kinds—first, such as may be most strikingly illustrated in a Daguerreotype, the plate of which is bent, if ever so slightly. Suppose the Daguerreotype to be so much bent that that part of it which is at *w*, lies in the direction of the dotted line *b*, *b*, the angle of incidence would be in the direction of the dotted line *w*, A; and in order to prevent reflections from any light object being seen in the plate, and appearing as false light in what should be the shadows, the screen would have to be extended until it cut that dotted line. A picture to be copied is not likely to be as much out of truth of level as is shown in this diagram, but it is difficult to make slight variations from flatness evident in a sketch. Nevertheless, these variations occur, and must be provided for by a certain extension of the non-reflecting surface.

The second kind of irregularity of surface which requires the extension of the non-reflecting screen, is that which arises from the nature of the surface of the picture to be copied; that is, in the

* Read before the London and Provincial Photographic Association.

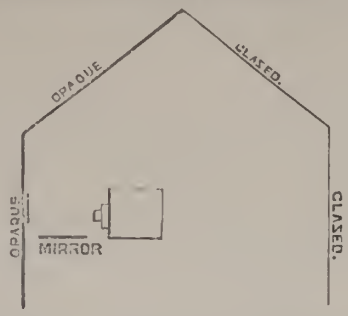
case of paper pictures, each elevation caused by the grain of the paper will have a surface on one side inclined towards, and on the other side away from, the source of light. This inclination is very small, but unless it is taken into account, and if the non-reflecting screen be not large enough to include lines drawn from the lens to each part of such inclined surface and carried back at a similar angle, there will be reflections from one side of each elevation or prominence. This will produce an effect which I dare say many will remember to have seen on the top of a copy of a paper photograph, the effect of a blanketn sort of texture.

The blankety texture just referred to is not to be confounded with what is known as granularity, although both proceed from the roughness or grain of the original. The former is confined to the side or top of the picture on that edge which is nearest the source of light, whereas the latter effect is visible all over. The former effect, moreover, may be got rid of by employing light falling at an angle nearly parallel to the plane of the picture; that is what is called strong side light, whereas the general texture or grain which proceeds from the irregularities or texture of the picture copied being lighted up more on one side than the other, is aggravated by this side light (whichever side, top or edge it comes from), and is ameliorated by the light being made to come as much from the front as possible. If a sheet of rough drawing paper be held so that the light falls upon it nearly sidewise, the grain will be strongly visible; but if the light fall on its surface almost perpendicularly—say over the shoulder of the observer who holds the paper square in front of him—the grain becomes almost invisible. If the paper be held so that two equal lights fall upon it from opposite directions the sides of the prominences that receive the least illumination from one source of light will receive the most from the other, and the surface will be greatly equalised. If, however, these lights be of the nature of what has been referred to as strongly side lights, there will be pits and prominences which receive more or less light, and some grain will still be apparent.

The question now arises, how is it best to carry out in practice the principles that have been discussed. First, the light must not come so much from the front as to cause reflection; second, the light must come as much from the front as possible, consistently with the first requirement, in order not to bring into strong relief the grain of the paper; third, there should be at least two sources of light proceeding from opposite directions. If a ring or circle of light could be secured coming from a direction behind and around the observer (or the lens), and at just such an angular distance as to avoid being reflected from any shining or polished part of the surface of the picture to be copied, the most favourable results should be obtained. This is very nearly the plan which was adopted and recommended long since, of laying the picture upon the ground, and suspending the camera vertically over it. Of course there must, in order to avoid reflections, be a screen on or below the camera, or else a canopy above, of the dimensions indicated by the requirements shown in the diagram.

The method of copying on the ground, however, is inconvenient, and other plans have been devised. One such plan consists in a prolongation of the camera by four rods at the corners, as far as the plane of the picture. This prolongation is surrounded by tissue paper; the sides which are nearest to the light diffuse it, and those farthest from the light reflect back a considerable amount, so that the grain is lit more or less from all sides, and is very little visible. The lens, however, receives as much light upon it or its mounting as the picture does; this light is just where it will cause the most reflection, so that the brass mounting should be provided with a tube or hood covered with black velvet. Another plan, and one that I have known adopted with success, is to cover a sheet of millboard with velvet, and fit it on to the hood of the lens. With this arrangement, however, the camera should be pointed so that the light from the window or sky does not fall upon the lens, as it would, for instance, if the whole arrangement were worked parallel with and close to the window. In such a case I have seen the brass rim of the lens reflected in a Daguerreotype which had been set up to be copied. Moreover, unless a lens of long focus be employed, the screen, if large enough to be effective with all sizes of picture that may have to be copied, will, especially when the lens is brought near the original in order to make an enlarged copy, be apt to cut off the front light too much.

The plan which I adopt is to fix the picture upon the middle of the wall of the shady side of the studio. The studio is of the ordinary central ridge kind, and the south side of both ridge and upright wall is kept opaque. The light from the whole of the opposite ridge and glazed side fall upon the picture, but reflections are in the ordinary way avoided by using a large camera, the front being more than twice as long as the picture to be copied, with a



lens of long focus, of course. If the picture is so large, or the surface so irregular, that the surface of the camera is not large enough to make sure against reflections, a background screen may be placed behind it. This, if so far removed from the picture as to receive light from the top or ridge light of the studio, should be tilted forward sufficiently to prevent that; or a simple plan may be adopted—that of placing something upon the camera just high enough to cut off reflection.

The light as arranged falls very much from the front, and from a considerable surface—twenty-four feet in length, twelve on each side of the camera—so that the grain of the paper is not very evident. In order, however, to make it still less so, a mirror is placed horizontaliy below the picture between it and the camera. A sheet of white card may be substituted as more convenient than the mirror, but is not quite so good.

What has been said has reference principally to copying photographs upon paper, and for other subjects some modifications may be necessary or desirable. Oil paintings and artistic designs generally are produced with the light coming over the artist's left shoulder, and the painting may show less grain when lit up from the same direction as that in which it has been painted than when equally lighted from all directions. In this case, while what has been said as to the avoidance of reflections will still apply, the direction of the light may be altered to what is required, by blinding one-half (the right) of the studio, or by copying in the length of the studio instead of its breadth. With Daguerreotypes, again, it will generally be desirable to place them upon their side, as the polishing of the plate (except those of the stereoscopic form) was in the direction of lines across the picture. If anyone hold a Daguerreotype under a vertical light and change its position as indicated, he will observe a great difference of brightness.

Various plans for avoiding granularity in copying have been suggested, which are not based upon the considerations that have been referred to. One such plan is to copy with a lens somewhat out of focus. Another is to move the lens during exposure. It is obvious, however, that with such methods the loss of sharpness of texture of the grain, must be accompanied by loss of sharpness of the details of the photograph, at all events of such details as are defined in lines not broader than the grain which has to be got rid of. Of course cases may arise in which it is desirable to lose the sharpness of the original picture, but not when an exact reproduction of it is required. I once had occasion to make an enlargement from a pen-and-ink sketch portrait of a gentleman; the enlargement was to match and form a pair with one of a lady which had been made from a photograph in the usual way. I therefore copied the drawing with a lens possessing no sharp focus—the back of a portrait combination—and the softened edges thus given to the ink lines, enabled the artist to paint the enlargement with a sufficient satisfactory resemblance to a photograph from life.

Naturally the less grain there is upon the surface of paper photographs, the less there will be to be copied; and an obvious preparation for copying is to roll the print well if the surface requires it. I have known burnishing successfully adopted for the same purpose.

DEVELOPERS AND DEVELOPMENT.

BY ALFRED GITHRIE.*

I shall now go over in a very short way some of the developers at present in use, and, as far as I can, the mode in which those developers should be employed. I have already alluded suffi-

Continued from page 91

ciently to the ferrous oxalate, and will take the pyro and potash developer. The formula is as follows :—

No. 1.—Pyro. Solution.

Warm water	2 ounces
Sulphite of soda	2 ,,

When cold add—

Sulphurous acid	2 ounces
Pyrogallic acid	½ ounce

In all cases these weights are calculated at 437 grains to the ounce.

No. 2.—Potash Solution.

A.

Water	4 ounces
Carbonate of potash	3 ,,

B.

Water	3 ounces
Sulphite of soda	2 ,,

When dissolved, mix A and B. These two stock solutions will keep a very long time. I have some made up last spring as good as when first mixed. In this developer purity of the ingredients is a *sine qua non*. For instantaneous exposures take three ounces of water, and add three drachms of No. 1 and 2 drachms of No. 2. This, being a very strong solution, will usually bring out the image rapidly and with full density; but if more strength be necessary, add No. 2. For ordinary exposures and very rapid plates (not drop shutter) less than half this strength of developer will be found ample; in fact, one drachm of No. 1 and half-a-drachm of No. 2 to three ounces of water will be found to give excellent results, with the shadows clear, and at the same time, having all detail. Should the plate, however, not give sufficient density, one or two drops of a solution of ammonia—one to ten of water—will be found to act very rapidly, and give density to the image. Though I have given these proportions they are, of course, subject to considerable variation with the nature of subject and amount of exposure given. If over-exposed, less of No. 2 and weaker development; if under-exposed, more of No. 2 and stronger developer—more of No. 1 for vigour, and more of No. 2 for detail. This developer does not stain or cause fog, though it is said by some to cause frilling. This, however, is not my experience.

Next, the washing soda developer :—Stock Solution No. 1—Add clear crystals of soda till no more will dissolve.

No. 2.

Water	40 ounces
Oxalic acid	96 grains
Bromide of potassium	40 ,,

For use : to one ounce of water add a-quarter of an ounce of No. 1 and pour over the plate. Then take one ounce of No. 2, add one grain of dry pyro, pour the soda solution off the plate into this, mix, then pour on the plate, and you will get any amount of density and detail if you have exposed properly. Another formula gives :—

No. 1.

Sulphite of soda	4 ounces
Hot water	10 ,,

Add four ounces of sulphurous acid, and pour into one ounce of pyrogallic acid.

No. 2.

Washing soda	3½ ounces
Sulphite of soda	¾ ounce
Water	64 ounces

For use; take one drachm of No. 1 to each ounce of No. 2. This formula will also give plenty of density and detail where correct exposure has been given. If plates are over-exposed, twice the quantity of water must be used. The washing-soda developer seems to have very little power to force up an under-exposed plate, and an alum bath must always be used to remove the yellow colour given to the negative. Of the two formulæ above, the one mentioned first gave me the most satisfaction.

Sulphite of Soda.

There are several formulæ given in the photographic journals, but the one I like best is—

Sulphite of soda	4 ounces
Hot water	56 ,,

Neutralise with citric acid, and then add one ounce of pyrogallic acid.

No. 1.

Ammonia	1 ounce
Bromide	180 grains
Water	40 ounces

With equal parts of Nos. 1 and 2 for correct exposure. This is an excellent developer, and I prefer it in every case when copying. For under-exposure more of No. 2, and for over-exposure less. With this formula you can have thorough command over your plate, though there are some plates which give green fog and metallic stains when any attempt is made to force them with this developer; but the rule is a brilliant, bright negative. The ferrous-oxalate, the potash, the washing-soda, and the sulphite-of-soda developers can be used over and over again till exhausted.

For a rapid developer the one I like best is Swan's :—

No. 1.

Pyrogallic acid	30 grains
Water	10 ounces

No. 2.

Ammonia	1 drachm
Bromide of ammonium	1 ,,
Water	10 ounces

With equal parts for correct exposure. This developer acts very rapidly, and, therefore, requires to be watched closely. For under-exposure more of No. 2, and for over-exposure less. The best way when using this developer is to add No. 2 a little at at a time till sufficient strength is obtained. New developer must be mixed for each plate.

THE PLATINOTYPE PROCESS.

BY H. G. TEMPLETON.*

Although this process has not yet become so popular as it ought to be, yet I think if its merits were better known it would be more appreciated by the public than it now is. Allow me, then, briefly to point out what I would claim as the peculiar merits of the platinotype process.

First, I would claim for it the permanency of its prints—a point on which so much discussion has arisen of late with regard to silver prints, which have been a source of anxiety and vexation to photographers so far, and I am afraid will continue to be until we have more light thrown on what is the precise nature of a silver print. In the platinotype print, as its title denotes, the image is formed by the deposition of metallic platinum, so, if the cause of fading in silver prints is due to complex silver salts, this difficulty is entirely removed. Again : no sulphur compounds are employed in the development and fixing, and if hypo. be the scapegoat in silver prints, we have nothing to fear from that source.

Next, I would claim for it the greater rapidity in printing, namely, from one-half to one-third the time required to print from the same negative on silver paper, especially in dull weather, when the platino paper has the decided advantage. This has been accounted for by supposing the blue rays of the spectrum are equally as active on the platino paper as the violet, whereas the violet rays are necessary to impress the image on silver paper.

In the next place, I would claim the artistic softness and delicacy of the prints, which, when properly printed from a suitable negative, more resemble a fine engraving or well-executed pencil drawing.

And last, but not least, I must not omit to mention the simplicity of the process, which renders it so admirably adapted to the requirements of amateurs who have not the time or convenience for the more troublesome washing processes necessary in silver printing, as the prints by this process can easily be finished off in half-an-hour, and when done they offer an excellent medium for the artist to colour upon without any fear of defects showing themselves afterwards. One of the chief objections raised against platinotypes is the coldness of the tone, but this has to a great extent been overcome by the introduction of specially-prepared paper and toning solutions, which give a sepia tint.

Another field has recently been opened for the platinotype process, namely, enlargements for the artist which can be readily executed by means of the solar camera or electric light, and form an excellent basis to receive the colours. Neither is this process

* A communication to the Newcastle-on-Tyne and Northern Counties' Photographic Association.

confined to paper, as equally good results can be obtained on linen or silk fabrics, and even on wood.

Having now put forth the merits of the process, allow me to explain the *modus operandi*. The paper is coated with a solution of ferric oxalate and potassic-chloro-platinite, and if I expose it to the action of light the ferric oxalate will become converted into ferrous oxalate, and if exposed behind a negative will give a faint brown image. All that now remains to be done is to cause this image to throw down the metallic platinum it contains, and this is readily done by floating it on a hot solution of neutral oxalate of potash, 130 grains to the ounce, and which I have raised to a temperature of 170° Fahr. in an enamelled iron dish, when the iron salts are dissolved out, and the metallic platinum thrown down *in situ*, forming a black image; or, if I use the special paper and add some of the toning solution to the bath, it will give a sepia-tinted picture. It only remains now to dissolve out any traces of iron salts which may remain in the paper by passing it through a two-per-cent. solution of hydrochloric acid, changing the solution when any trace of redness appears in it, and then washing them in frequent changes of fresh water for about thirty minutes, when they may be hung up across a string to dry.

Simple as the process may appear, there are, nevertheless, some precautions which must be observed:—First, the paper must be kept absolutely dry by being placed in a canister with calcium chloride, seeing that the printing-frames and pads are dry, and, especially in damp weather like the present, placing a piece of rubber cloth or oiled silk behind the paper in the printing-frame. By taking these precautions, there is little fear of the paper keeping; indeed, some I am using to-night I have had in my possession nearly two years. Second, not to continue the printing longer than is necessary to have a faint but distinct image on the paper. Third, to regulate the temperature of the bath to the amount of exposure the prints have received, under-printed ones requiring a higher temperature, and over-printed ones a lower temperature, always bearing in mind that the prints will appear darker when they are dry. Fourth, to see that the last acid bath is not in the least discoloured if you want to have pure whites. And, lastly, to obtain a licence from the Platinotype Company to work this process, which is a patent one, but which is not a serious obstacle, as for the payment of five shillings you can obtain a licence for the rest of your natural life on condition that you buy all your materials from them, which they supply at market prices.

HOME PORTRAITURE: LIGHTING, POSING, AND RETOUCHING.

BY T. N. ARMSTRONG.*

I now come to the other subject which we have to consider—retouching. It is to my mind the most delightful occupation an amateur can give himself up to. It is cleanly, and can be done even in the most elegant drawing-room. I should have preferred, had circumstances enabled me, to show you by daylight what little I know of this delightful branch of our art. Still I must do the best I can with the aid of artificial light. I wish it to be distinctly understood, however, that I strongly recommend all those who are desirous of practising retouching to do so by daylight.

It is now nearly fourteen years since retouching was first introduced, and for a long time there was a great outcry against it; but, like every other good thing, it has steadily advanced until it has now become a necessary branch of our art, and no gallery is complete without its staff of retouchers.

When I first made up my mind to practise portraiture I soon found out that retouching was a most necessary step to the success of my endeavours; and I set myself to study it. I read all the books and articles I could find. I was told it was very difficult, and that I had better give my negatives to a retoucher to have them properly done, as I would be sure to spoil any negative if I tried my "prentice" hand upon. But I said to myself, "I don't see if others can do it so easily, what is to prevent me;" so I decided to take a few lessons from a competent teacher. I was given to understand from what I had read that quite a dreadful list of articles were necessary, such as powdered cuttle-fish, ground resin, powdered black-lead, Indian ink, black-lead pencils, stumps, sable brushes, &c.; but I soon found out that in this, like other matters, the best thing was ocular demonstration. So I went to Mr. Horatio Paterson, who soon put me on the right road without the aid of anything but this little tool here, which is only a hard lead pencil—it is a 6 H Faber. At first I had not a retouching desk, but I made a very good substitute for one by simply using a printing-frame. Try it, and you will be surprised how well you can get on with one. If you can obtain a proper desk, however, by all means get one. It is no doubt a much more complete and comfortable way to work with its aid.

To assist those of you who desire to learn retouching, I propose to place on my desk two negatives. One of them will be a finished negative, so that I will be enabled to point out to you the difference between a re-touched negative and one that has not been so treated. By this means you will more readily be able to see the inequalities. The first thing to learn is to find out the bad places in a negative. This you will soon come to understand. It is just like knowing the disease is half the cure, and the rest follows. In the first place, examine the high-lights and see if there be any patches less opaque than their surroundings. If so, they must be made of the same opacity. See if there be any little specks, such as freckles would make. If so, they must be filled up, then blend the high-lights into the shaded parts, soften down the shadows, and, having done this, you will have accomplished a deal.

I find a very prevalent notion among amateurs is, that a negative requires some preparation before it is ready for retouching, such as the application of some retouching medium to cause the pencil to "bite," as the saying goes. Now it is only very seldom such is needed. If your negative has been varnished with the ordinary spirit negative varnish, it will need no medium. The varnish, when thoroughly hardened, will take the pencil well enough, and this just brings me to another point that amateurs make an error in. They think that unless they can see the marks the pencil makes with each touch they give, that the lead pencil is not doing its work, and that they must have recourse to some medium to enable them to see the work they are doing. This is just the very thing they must avoid doing.

I will just here tell you that I feel the mistakes most common to beginners are, that they do not use hard enough pencils, and they do not keep them sharp enough, nor do they touch lightly enough. The negative being varnished and perfectly hardened, it is then set on the desk, and the work begins, as you will see me operate presently. Let me say this before commencing: touch as lightly as you can. Only let the lead just touch the varnish, and do not press it on. Most retouchers acquire a special touch of their own, just like learning a special style of writing. You will with practice acquire the best way of touching. Although you do not see the marks the pencil makes, you will find the flaws you are touching gradually disappear, and this is just what you require to do. Do not go too near the negative, but so far away that you can only see the patches the flaws make, and which have to be filled up.

Some of you may think it would be best to take a magnifying glass, and with its aid touch out all the imperfections. No more fatal mistake can be made; for, where you to do so after all your exertion when you come to examine the negative, and are prepared to look with pride upon your persevering efforts, you would be surprised and disappointed to find it showing nearly the same appearance as at the commencement. Yet this should not be astonishing, for it is an artistically acknowledged fact that detail and effect are simultaneously unattainable, and this experience of retouching is further proof to the establishment of this fact. Do not use a magnifying glass. Never attempt to fill up a spot with one touch. The point of your pencil should be as sharp as a darning needle. This is obtained by rubbing it on a piece of fine sand paper. So soon as you sharpen your pencil, just touch a piece of paper with it to take off the scratchy point, but do not blunt it.

At first I recommend you to practise on small heads; you will find large ones more difficult. I will show you a negative I first retouched and a print from the same. What I have done, all of you are quite as well able to accomplish. Practice and patience are all that is needed. It sometimes happens that in lighting a sitter the catch-lights are not the same on both eyes. I will show you how to take out a false light, and so save many a negative that would otherwise be almost worthless.

Do not be frightened to touch your negative. You will thus soon be quite at home at the work, and after a little practice you will find retouching a valuable aid to development, printing, &c. I know of nothing better that enables one to judge of proper density than the examination of a negative for retouching; it will assist you to say at once. This plate is too thin, or this

* Continued from page 790.

too dense, or this under-exposed or over-exposed, or over- or under-developed. You will find it a most valuable aid to the other branches of our art, and he who is an adept at it must be a long way ahead of his brother who is not. I strongly recommend you all to practise it.

I hope I have not detained you too long. I will now proceed to work, which will doubtless interest you more than listening to my paper.

Notes.

To-morrow the YEAR-BOOK OF PHOTOGRAPHY for 1885 will be published, and those who wish to have it before Christmas should order it at once. Indeed, none who practise photography, either as professionals or amateurs, can afford to be without this Annual.

Chinese ink—so often called Indian ink—forms one of the best pigments for carbon tissue, especially when the tissue is required for making transparencies intended to be used in making enlarged negatives; but up to the present but little has been known concerning the manufacture of Chinese ink, excepting the mere fact that its essential constituent is carbon in a wonderfully fine state of division.

Mr. Chen-Ki-Souen, in his recent memoir on the subject, points out that soot obtained by carefully burning pine wood is generally used; but other varieties of lamp-black are occasionally employed. The binding material is gelatine, obtained by boiling the horns of the rhinoceros or the deer, but common glue is used for the cheaper inks. The grinding of the pigment between stones is a most laborious operation, and it appears that in this matter. European machinery will not successfully compete with hand labour in China.

Anthony's Photographic Bulletin is to be edited by Professor C. F. Chandler, of Columbia College, New York, and in his hands it will doubtless maintain the leading position which it has so long occupied in the United States.

The photographer of Aldershot who found some kind of an explosive cartridge and ignited it at a gas flame has fallen a victim to his rashness; but if the police can successfully "investigate the nature of the explosive" now, they possess far more ability than is usually displayed, even by the high-salaried functionaries who deliberate upon damage done by such dynamite explosions as give the Londoners subject matter for talk.

The damage done to London Bridge has been photographed, and the photographs are to be submitted to "microscopical examination."

But the most difficult part of the task has been to find the damaged portion of the bridge; and it required the united energies of Captain Cundill, R.E., Colonel Majendie, C.B., Her Majesty's Inspector of Explosives, and Dr. Dupre, F.C.S., &c., to find—after one day of fruitless search—"a 'long' irregular crack which can be *distinctly traced for several inches*, and is *nearly wide enough for the insertion of the finger nail!*" The work of the photographer was now easy, and if he takes his negative of the same size as the original, his photograph will very nearly resemble Mr. Auty's picture of lightning, which we reproduced on page 676. Still further examination has revealed the presence of a few more cracks, besides the "long" one.

If Her Majesty's Inspector of Explosives will take a walk across Waterloo Bridge, he will find several minute fissures very nearly resembling that discovered in the stone-work of London Bridge.

One of the "specials" of the *Pall Mall Gazette* has been investigating dry plate photography, which he terms "a winter amusement." In a number of the paper this week, he describes a visit to an establishment where there is a notice in the window to the effect that lessons in photography are given free to all purchasers of cameras. It may be interesting to our readers to know that the manager undertook to turn out the "special" a complete photographer after four lessons; that, as a rule, ladies are the quickest and most adroit of the pupils; and that although the winter is usually a slack time of the year, the firm can hardly execute their orders, they are so very busy with this now fashionable amusement.

The Stock Exchange, the Corn Exchange, and the great trading centres of Mincing Lane, have been sorely fluttered during the last fortnight. It appears that for a twelve month or more, a chiel has been among them taking notes of the features of the more prominent men. Unobserved, an industrious Italian artist has haunted these busy scenes of City life, and secured in his sketch-book some 200 or more portraits. These he has elaborated and coloured after the style of the *Vanity Fair* cartoons, and, when quite ready, burst upon the unsuspecting civic notabilities with a full-fledged collection, which he exhibited in a room in Mark Lane taken for the purpose. The charge for admission during the first two days was half-a-crown, and so thronged was the gallery with the subjects of the portraits, their friends and their enemies, that the enterprising promoter cleared, so it is said, over £40 before he reduced the admission to a shilling. The pictures are said to be exceedingly clear, the artist having caught the peculiarities of attitude or gait in each case with almost photographic literalness. Many of the unconscious sitters are not at all pleased at seeing themselves as others see them, and there has been a good deal of talk about actions for libel. If the portraits are not offensive, but only truthful, it is, however, difficult to see where the libel comes in.

The infant Duke of Albany is being brought up in the way he should go—photographing. Last week he sat for his portrait with and without the Duchess. The happy photographer was Mr. Byrne, of Richmond.

A photograph of lightning in which very many tree-like flashes are shown, has been taken by M. Desquesnes, of Billancourt, and in general appearance this photograph is very similar to that of Herr Haensel (page 2 of present volume).

It has sometimes been held as a reproach to photographers that they paid famous actresses, and equally famous professional beauties, to sit to them. Those who have been so blamed may take consolation in the fact that a well-known painter paid an equally well-known lady the large sum of £400 to be allowed to take her portrait, which was afterwards exhibited in the Royal Academy.

Someone at the French Embassy knows English well enough to attempt a *calembour* in it. "The copy of the Franco-Chinese Treaty (about which there has been such a hot controversy) turns out not to have been done by photography," says the waggish *attaché*. "It was prepared, forged alterations and all, by a process of photo-*lie*-thography."

Two dollars a dozen appears to be the price of cabinets in some of the studios at Philadelphia, and, what is more, the pictures are good ones.

The mania for collecting things is always acute. It is only the objects of the collector's industry which change. The fashion of collecting photographs of the hands of one's friend, first introduced some years ago for practical purposes by an artist, is now becoming quite widely spread, and albums specially designed—handsome ones, of course—may be seen on many a table. The offer of a photograph of a bachelor's hand to a lady is, however, a little dangerous, we should think. "Hand and carte" is rather too much like "hand and heart," for the present to be quite safe. As a matter of fact, the rage for hand cartes—dog cartes are now gone out to a great extent—is due in great measure to the revived taste for palmistry or chiromancy, a study which a recently-published work, containing reproductions of the hands of most of the celebrities of Europe, did much to encourage.

It is interesting to note how they make large representations of the structural characters of rocks in the National Museum at Cambridge, Mass. Photo-micrographic negatives of between two and three inches in diameter are first made from the rock-sections, and from these enlarged positives of about twelve inches in diameter are taken; but care is taken not to make these prints too dense. The colours and any features not brought out by the camera are then filled in by hand. In this way the greatest accuracy of detail is ensured, while the colouring materially assists the students.

A friend of ours, who is just back from the Highlands, has brought back a number of cartes, in which he appears in the most Gaelic chieftain-like garb, including sporran, phillibeg, claymore, and all the rest of it. As he had only visited the "land of rough moor and shaggy wood" for a fortnight, we wondered that he had so thoroughly identified himself with Caledonian notions in so short a time, and learned in reply that he owed his Gaelic "get-up" to the enterprise of the Fort-Williams photographer who took him. He had, in fact, been provided with the Highland dress at the studio free of charge, and from what he was told, it seems that a large number of tourists are annually induced to change the breeks for the kilt *pro tem* in a similar way. We should think, though, that though there is no announced charge for the dress, it is in some way included in the price of the cartes. It surely cannot be that these pseudo Highlanders are allowed to get off "Scot-free?"

It is not in Scotland only, however, that this kind of thing is done. If we are correctly informed, there are several cheap photographic galleries in London where a customer has the right, on payment of an extra threepence, to be "taken" in the military uniform (generally a guardsman's, with the bearskin hat well *en evidence*). So too, in studios specially patronised by domestic servants, the loan of items of massive spurious jewellery for the personal adornment of the sitters, is not uncommon; there is one enterprising artist, in fact, who not only loads his patronesses temporarily with aluminium ornaments, but for a small additional sum will take any servant girl on a specially prepared card, there being a corporal in full regimentals introduced in the background.

That a few energetic Radicals are determined, if possible, to bring in a Hindoo for some English or Irish constituency at the next general election is certain; and it is also a fact that an active correspondence is going on with leaders of the educated "Baboo" party in India, with a view to the selection of a suitable native candidate. Rumour has it, too, that at the last meeting of the English M.P.'s and others most concerned, the cartes of several Bengalee reformers were submitted with a view to the selection of this said candidate. But we can hardly believe that the choice will be made in this way. If it is indeed intended to choose an embryo statesman, it would surely be well to insist on seeing how he had come out in a "cabinet" rather than in a carte.

The taste just now seems to point in the direction of portraits suitable for framing rather than for placing in our albums. As there is nothing the public likes better than being saved trouble, photographers will do well to cater for this particular taste, not only by adapting their work, but by exhibiting it in a complete state—that is to say, in frames suitable for standing on tables, whatnots, mantel-pieces, and so forth. Attention to such little matters as this is one of the secrets of commercial success.

It would appear that photogravure is but slightly used in America. The plates have to be prepared in Paris, and as every one is printed by hand, the expense is very great, and, what is equally an obstacle in the estimation of the go-a-head American publishers, the time absorbed is very long. Apparently American book-buyers do not yet appreciate the qualities of *editions de luxe*.

Patent Intelligence.

Applications for Letters Patent.

16,334. SAMUEL DUNSEITH MCKELLEN, 18, Brown Street, Manchester, for "Improvements in photographic cameras."—Dated 12th December, 1884.

Specification published during the week.

13,774. JOHN MITCHELL DOWLING WORSNOP, of 154, Leeds Road, Bradford, in the county of York, Photographic Artist, for "An improved method of transferring the film of photographs, or a film of colour painted upon photographs to canvas or other surfaces." Dated 17th October, 1884.

I take the photograph upon glass or paper or any other suitable surface, which has been previously prepared by coating it with a thin layer of wax or other substance to which the film of the photograph will lightly adhere, but which will afterward allow such film to be easily peeled off. To transfer or remove the film of the photograph, the canvas or other suitable surface on to which it is to be permanently transferred is covered with dissolved gelatine or strong waterproof cement, and then pressed against the film and held there until the cement becomes firmly fixed to the film, when, by separating the canvas from the glass or paper, the film will be detached from such glass or paper and securely cemented upon the surface of the canvas where it is intended to remain permanently.

To transfer or remove a coloured photograph, or a film of colour which has been painted upon the surface of a photograph, the film is painted in the required colours before being transferred, and is then transferred temporarily to a surface prepared with wax as hereinbefore mentioned, the film is then finally transferred to the surface upon which it is intended to remain permanently fixed, and to which it is securely fixed by dissolved gelatine or strong waterproof cement, in the manner hereinbefore described.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is :—

Taking photographs or painting such photographs or pictures upon a surface covered with a slightly adhesive material which will admit of the film of the photograph or the film of colour painted upon such photograph or picture being peeled off and attached permanently to a canvas or other durable material in the manner hereinbefore described.

Patents Granted in America.

308,468. WALTER CLARK, New York, N.Y., "Photographic Camera." Filed May 7, 1884.—(No model).

Claim.—1. A photographic camera box having a partition forming a separate focussing-chamber with an object glass in one side thereof, and a movable lens constructed to coincide with either of said apertures, substantially as shown and described.

2. The combination in a camera-box having separate apertures *c d*, of partition *e*, mirror *f*, object-glass *g*, and movable lens-holder C, substantially as shown and described.

3. The combination with a camera-box having a separate focussing-chamber, of a lens fitted for movement into position at either the focussing or exposure apertures, substantially as described.

4. The combination with a camera having a separate focussing-chamber, of the pivoted lens holder C, and a catch for retaining the holder in a raised position, substantially as described.

5. The combination with a camera having a separate focussing-chamber, of the movable lens holder C, lens-tube *p*, provided with a rack, and a shaft and pinion, *q*, substantially as described.

6. The combination, with a camera having a separate focussing chamber, a pinion for adjusting the lens, and a movable lens having a rack that engages the pinion in one position of the lens substantially as described.

7. The combination, with a camera having a separate focussing-chamber, of swinging lens-holder, C, arm *n*, catch *s*, substantially as described.

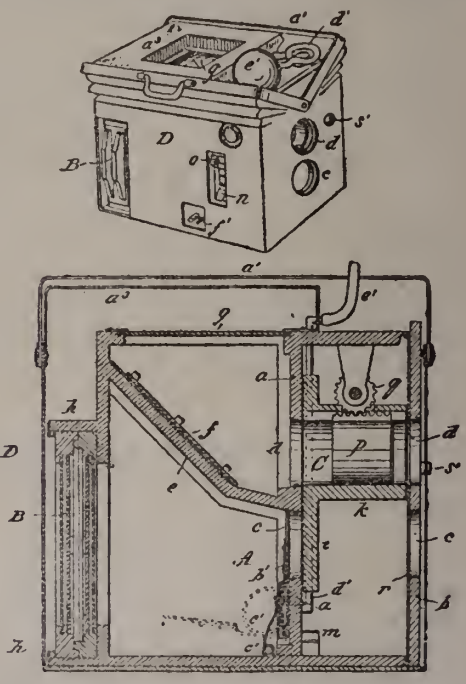
8. In a camera having a swinging lens-holder, the combination therewith of a buffer-spriug, substantially as described.

9. In a camera, the diaphragm or hood a^3, combined with a case having a folding top, substantially as described.

10. The combination, with a camera having a swinging lens-holder and separate focussing-chamber, of a movable shutter covering the exposure-aperture, and a trip for releasing the shutter substantially as described.

11. The combination, with a camera having a swinging lens-holder, and a separate focussing-chamber, of a pivoted shutter covering the exposure-aperture, and fitted to rotate for exposure of the plate, substantially as described.

12. The combination, with a camera having a swinging lens-holder and a separate focussing-chamber, of the pivoted shutter *r*,



spring *v*, and catch *s*, substantially as described, for operation as specified.

13. In a camera having a separate focussing-chamber and a movable lens, a moving shutter for instantaneous work, arranged to be automatically released by the lens-holder when moved, substantially as described.

14. The case D, having a hinged frame, *a'*, combined with a camera, substantially as and for the purpose specified.

308,469. WALTER CLARK, New York, N.Y., "Photographic Camera." Filed Aug. 8, 1883. Renewed Aug. 14, 1884. (No model).

Claim.—1. In photographic cameras in which the following elements are combined—namely, an adjustable lens, a device for holding and exposing the sensitive plate at the back of the lens, a focussing-glass in the top or side of the camera-box, and a reflector for throwing the image upon the focussing-glass—a photographic camera-box, provided with two compartments, the one of which carrying the reflector is constructed with an open side next the lens, and made capable of adjustment in or out of connection with the lens, while the other compartment serves for exposure of the sensitive plate, substantially as specified.

2. In a photographic camera having an interior inclined mirror and upper glass focussing compartment capable of adjustment into and out of connection with the lens or lens-case of the instrument, the combination, with said compartment, of a movable diaphragm arranged to move between the lens and the mirror, essentially as and for the purposes herein described.

3. In a photographic camera, the combination, with the lens, of the bellows E, mirror-case F, reflector G, and diaphagm L, essentially as herein set forth.

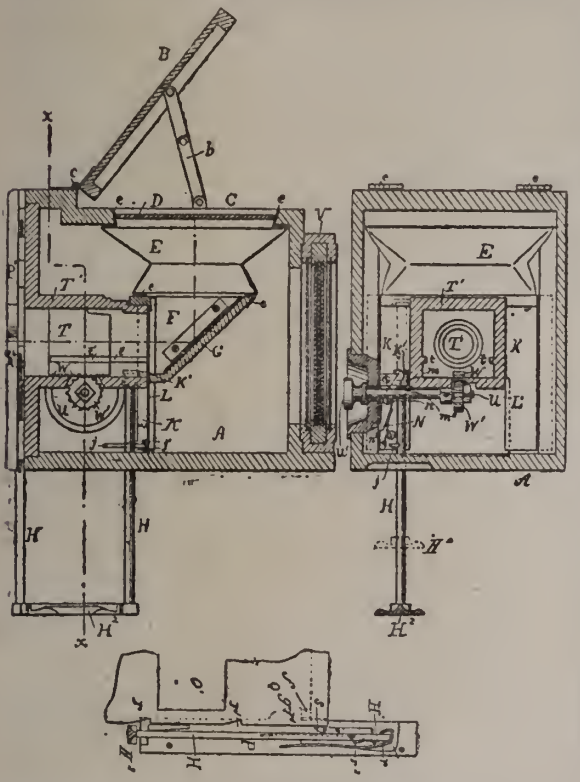
4. The combination of the sliding-rod H with its pin or projection *j*, the mirror-case F, and the spring-catch N, substantially as specified.

5. The combination of the sliding-rod H' with its attached spring r^2, the stationary spring r^3, and the drop Q, essentially as and for the purposes herein set forth.

6. The combination, with the camera-box A, bellows E, and mirror-case F, of the bent lapping strips *e e'*, for attachment of

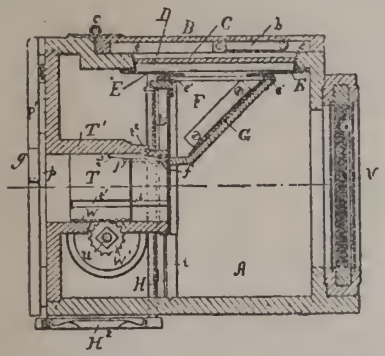
the bellows to the said box and case, substantially as herein shown and described.

7. In a photographic camera-box, the combination of the connected sliding rods H H′ with the focussing mirror-case F, its independently moving diaphragm L, the drop Q, and catches or



attachments connected with said rods for operating the mirror-case, its diaphragm, and the drop in relation with each other essentially as described.

8. The combination of the springs r^2 r^3 with the releasing



guide *s*, the rod H′, and the drop Q, substantially as and for the purpose specified.

9. In a photographic camera-box, the combination, with an interior focussing or mirror case, of the adjustable lens or lens-case T and frame T′, substantially as herin shown and described.

10. A photographic camera in which the following elements are combined : a camera-box fitted with an adjustable lens, and composed of an outer compartment for exposure of the sensitive plate, and an inner compartment or mirror-case adjustable into and out of line with the lens and inclosed on top by a fixed focussing-glass, and an independent moving diaphragm in front of said mirror-case, all arranged for operation in relation with each other other substantially as specified.

HOW TO PHOTOGRAPH MICROSCOPIC OBJECTS.

BY I. H. JENNINGS.

Lesson X.—Preparing Vegetable Tissues for Photography.

Dry-mounted vegetable preparations are not of much use to the photo-micrographer, except it be certain scales, such as those of the *Deutzia*, which can be successfully photographed with a low power by reflected light. In most cases the use of a bleaching liquid is necessary to get rid of the colouring matter, which must be removed before the tissues can be set up as transparent objects. The following bleaching liquids may be used :—1, Nitric acid ; 2, methylated alcohol ; 3, chlorinated soda.

1. Nitric acid must generally be used in a very dilute form, as many vegetable tissues, even those strongly impregnated with silica, are destroyed by it when pure. The stems of grasses, horsetails, and even leaves, as those of the *Deutzia*, may be bleached by gently heating in very dilute nitric acid. When the object appears sufficiently transparent, it must be well washed in distilled water to remove all trace of the acid, floated on a slide, and dried under cover. If the acid be used too strong, the object is decomposed, while if the washing be imperfect, crystals will form in its substance and render it useless.

2. Soaking in alcohol does very well for many objects, such as cuticles, and thin, semi-transparent leaves. They should be left in alcohol for some hours ; and when they have lost most of their chlorophyl the alcohol must be poured off, and some fresh added, until the objects become white. They may now be transferred to benzol or turpentine for some hours, when they are ready for mounting. Boiling in alcohol is hardly advisable, for although it considerably hastens the bleaching, it tends to make all plant-tissues too brittle for mounting.

3. The best mode of bleaching vegetable tissues is by means of chlorinated soda. The solution is prepared as follows :—Three or four ounces of good chloride of lime are taken, and put in about a quart of water. Stir the mixture a few times, and allow the sediment to settle ; after this the liquid had better be filtered through coarse filter-paper ; this is better than pouring the clear liquid off. Next, pour a strong solution of carbonate of soda into the chloride of lime solution, so long as a precipitate takes place, and allow the precipitate to subside. When clear, the solution should be tested with a few more drops of carbonate of soda, to ascertain if all the lime have been precipitated ; if not, more should be added, until no lime be left in the solution. Most of the solution, when clear, can be poured off, and must once more be filtered ; after which it should be stored in black or dark-coloured bottles, and well-corked, since both air and light speedily bring about decomposition.

A series of small glass pots should be provided to bleach the specimens. Shallow pomade pots are very suitable. Before leaves are immersed in the fluid, it is best to wash them in clean water with a soft brush, since all leaves are more or less covered with fine dust, which will sink into their substance if not removed when they are fresh. When they are quite clean, they may either be put in the bleaching liquid at once, or put between clean blotting-paper to dry. Dried leaves, as a rule, bleach more rapidly than green ones.

When a leaf happens to be more deeply coloured than usual, it is a good plan to immerse it in alcohol until most of the colour has been removed. This much facilitates the bleaching process. The time which tissues require to be soaked varies considerably. Some become translucent in a few hours, while others take many days ; others will show green patches which obstinately refuse to be bleached. In this case, remove the leaf, wash it well, and place it in alcohol for some hours. In this way all the chlorophyl will be dissolved out, when the soda solution will complete the processes. Care must be taken not to put too many

leaves at a time into one vessel; three or four is the average number.

When properly translucent, the leaves or tissues must be removed from the soda solution, and washed in distilled water, changing the water every few hours. If the tissues do not contain Raphides, the addition of a little hydrochloric or nitric acid to the second or third washing will increase their transparency. *Sulphuric* acid must not be used, or crystals of sulphate of lime, which is only slightly soluble in water and acids, may be formed in the tissues, and cannot be removed.

About twenty-four hours is necessary to properly wash the leaves; less time is not sufficient, and a longer immersion tends to disintegrate delicate tissues. The washing completed, they should be placed in alcohol, in which they must remain for some hours, and afterwards be transferred to turpentine until required for mounting.

The above bleaching process must be applied to sections of wood which are too strongly coloured for photography. It is hardly necessary to observe that all sections which are to be photographed should be of extreme thinness. Many which answer very well for examination under the microscope are far too thick for the photo-micrographer. Light-coloured sections, such as those of white pine, require merely saturation with benzol before mounting in the balsam solution. A section of deal, to show the characteristic "discs," should be mounted dry.

Spiral vessels, scalariform tissue, &c., will require but little treatment; the former, after drying and washing in alcohol and benzol, may at once be set up in balsam.

Cuticles may be prepared in the same way. In the case of very transparent tissues, staining will be of great use. Judson's dyes answer very well for this purpose, but all blue stains should be avoided in objects intended for photo-micrography.

Plant-crystals, or raphides, may be prepared either *in situ*, or separately. When mounted *in situ*, bleaching with alcohol is alone admissible. Raphides may be obtained from most plants by laying a leaf or stem on a slide, with the cut end about the middle; a gentle rolling pressure with a pencil will squeeze the juice and raphides out on the glass. Wash with alcohol, pour over a little turpentine, and mount in the usual way.

The following furnish good examples of raphides. Duck-weed, the onion, the willow-herb, the galium, or goose-grass. The large prismatic crystals of the onion or garlic polarise splendidly, and show better in a photograph when polarised light is used. In fact, many objects that are far too transparent to make good photographs can be easily managed by putting on the polariscope. When this is of no use, a piece of fine ground glass, or oiled paper, immediately below the slide will be of great service in softening the light. This will prolong the exposure, but give results that could not otherwise be attained.

For instruction as to staining vegetable tissues, the student is referred to a very valuable and practical paper by Dr. George D. Beatty, which appeared in "Science Gossip" for May, 1876; also to "Practical Microscopy," Chapter 12.

PHOTO-LITHOGRAPHY AND PHOTO-ZINCOGRAPHY.

BY MAJOR J. WATERHOUSE, B.S.C.,
Assistant Surveyor-General of India.

CHAPTER XVII.—MISCELLANEOUS PROCESSES—(*continued*).

3. *Dusting Processes.*—Several photo-lithographic processes have been proposed, founded on what is known as the dusting process—*i. e.*, the stone, zinc plate, or tranafer paper is prepared with some composition, which, either being hygroscopic and capable of attracting moisture from the atmosphere, loses this property by exposure to light, or the reverse, and the image is developed by dusting on a resinous powder capable of attracting printing ink.

So far as the writer knows, none of these processes have come into very practical use.

Mr. Hanniford coats paper with a mixture of bichromate of potash, ammonio-citrate of iron, albumen, honey, and water, and exposes when dry under a transparent positive. The parts acted on by light become hard and insoluble. The image is brought out with a resinous gum. The paper bearing the image is laid face downwards on a clean-grained lithographic stone. A warm iron is passed over the back, causing the resin to adhere to the stone.

Removing the paper, a solution of gum and nitric acid is allowed to remain on the stone for a time, and the ink roller being applied, the ink takes only on the resin.

Mr. Lallemand coats paper with a solution of perchloride of iron and tartaric acid to which some dextrine is added. When dry, the paper is exposed behind a negative, and then brushed over with a resinous powder composed of—

Lime soap, from tallow	1 part
Resinate of lime, from resin... ...	1 ,,
Lampblack	*quant. suff.*

These materials are mixed together and dissolved in benzole, and when the latter has evaporated the compound is reduced to powder; the exposed portions of the print absorb moisture and retain the powder. The developed design may be transferred to stone in the ordinary way.

The following process was patented by Mr. Window in 1870:—

Paper is prepared with a mixture of—

Honey	2 parts
Glucose	4 ,,
Albumen	3 ,,
Dextrine	1½ ,,
Sat. sol. bichromate of ammonia ...	7 ,,

The paper is exposed under a positive, and the image is developed in the usual way by brushing over with a resinous powder consisting of asphalt with one-fourth its weight of paraffin, or stearic acid or lampblack with one-fourth its weight of stearic acid.

The developed print is laid on the stone and heated sufficiently to melt the matter, and then passed through the press. On damping the back of the print the fatty powder is left in contact with the stone, and adheres thereto if the heating has been properly managed; while the moistened sensitive compound likewise adheres to the stone, and forms a protective coating against the fatty matters where the stone is rolled up in the usual way.

Herr Obernetter recommends the following process as peculiarly well adapted for the reproduction of line-drawings.

A copper, zinc, or glass plate is coated with a syrupy solution made of—

Gelatine	10 parts
Glycerine	2 ,,
Bichromate of ammonia	4 ,,
Water	50 ,,

This is dried upon the metal, and the plate is then exposed under a reversed negative. After exposure the film is dusted with very finely-powdered zinc, and if the picture is desired quite flat the operation is stopped as soon as the picture appears a positive by reflected light. If a deeper image be desired the plate is breathed upon, and the zinc powder is applied so as to penetrate deeply the unexposed portions of the plate. When the plate is sufficiently powdered, it is washed with water to get rid of part of the chromium salt. The remainder of the chromium salt suffices to render the whole of the gelatine surface insoluble on exposure to light, or by heating it to 15° C. When the film is insoluble it is etched with dilute muriatic acid, which, dissolving the zinc, liberates hydrogen, which renders the gelatine soluble again. By moistening with water the image may be printed from in the same way as a lithographic stone.

Herr Obernetter says the results are sharper than can be obtained by any other known process.

4. *Other Processes.*—In addition to these special processes, there are other modifications of the ordinary methods which may be mentioned.

Mr. A. Wood inks his transfers, after exposure, by laying the print face upwards on cold water, and allowing it to remain till the gelatine can be traced on the surface. It is removed and laid face downwards on a sheet of plate glass which has previously received a thin coating of greasy ink, and gently rubbed over the back so as to bring the drawing into close contact with the ink. On removal, it will be found that the ink has attached itself to those parts only which have been acted on by light, the ground remaining perfectly pure and clean. If the quantity of ink is found not sufficient, the process can be repeated till it is so. The coating of gelatine should be strong, and the paper which gives the best results is albumenised, the surface of which has been rendered insoluble by steaming.

In the Year-Book for 1871, Mr. Swan published a method of photo-lithography dependent on the fact that caoutchouc is so altered by the action of light that, whereas in its natural state it does not communicate to a clean lithographic stone an ink-imbibing quality, by being strongly pressed into contact with it, it will, after being exposed to a few hours' sunshine, set off by strong pressure, and give to a lithographic stone a strong affinity for greasy ink. Paper is coated with a solution of india-rubber in benzole, and after the thorough evaporation of the solvent, is exposed to sunshine under a negative, and can then be transferred to stone.

As might be expected, several operators have tried to utilise the ordinary pigment tissue in photo-lithography, both in line and half-tone. A process of the kind seems to have been tried at Woolwich Arsenal, but was abandoned as giving no advantage over the ordinary process.

There are two ways of working. First, by transferring a positive carbon print on to the stone; and second, by transferring a negative print; and it is in this latter direction that the method seems likely to be most useful.

The fullest description of the process is given in the News, vol. xv., p. 387, as described by a writer in the *Photographic Archiv* (believed to be Dr. Schnauss).

The tissue is floated for two minutes on a five per cent. solution of pure bichromate of potash, and dried in an air-tight box with chloride of calcium.

The negative should be such as is used in ordinary photo-lithography—opaque in the ground, and quite clear in the lines. The border of the negative is protected by masking. After exposure to light, the tissue is squeegeed down in the usual way on to a smooth stone. After resting for a few minutes, the stone is placed in a sloping position in a trough, and warm water is poured over it till the supporting paper is loosened. The soluble gelatine is gradually washed away by pouring on gently a stream of warm water from the edge of the stone, and not upon the image itself, for fear of loosening the lines. When the image is clear and strong, the stone is immersed in cold water until it has become cool. It is then allowed to dry. When dry, it is covered with a solution of gum, as in the case of an ordinary lithographic drawing. This is allowed to dry, again moistened, and the lithographic ink applied repeatedly with a roller. The stone can then be printed in the usual way.

Mr. J. R. Sawyer, in addition to a process similar to the above, describes a method patented by him in which the tissue is coated with india-rubber solution, then attached face downwards to a piece of paper also coated with india-rubber as in the original Swan's process. After development, the image is transferred to stone or a piece of plate-glass previously coated with a mixture of gelatine, albumen, and bichromate of potash. The adhering paper is removed by moistening with benzole, and the image can then be gummed, and inked as in the last process.

The second method was patented by Mr. F. W. Window in 1871. He prints a negative image on gelatine or other analogous colloid from the subject itself, or from a positive obtained from a negative of the subject. After printing, he lays down the exposed proof upon a stone or zinc plate, and develops it with warm water in the usual way. The stone supporting the image so obtained is washed with alum and allowed to dry. It is then inked-up in the usual way; the negative gelatine image is removed with a sponge and water, and the fatty image remaining is treated in the usual way for lithographic printing.

Dr. J. Schnauss has also fully described this method in his "Lichtdruck und Photo-lithographie." The positive *cliche* must be masked all round with black paper, and the pigment tissue should not extend beyond the mask. A very short exposure is given. The tissue is transferred to the stone with cold water, and allowed to remain for at least half-an-hour or an hour under pressure. The stone is then washed with warm water to develop the image.

This should appear as a very weak negative with very clear lights. The stone is allowed to dry, and is then rolled in with thin litho-chalk ink, which produces a black surface all over. The stone is allowed to remain for some hours, so that the fatty ink may be absorbed by the stone, and the surface is then rubbed with a flannel pad dipped in gum-water. By this means the negative pigment print is removed, while the fatty image remains, and shows a regular positive image which can be treated and rolled up for printing in the usual way.

In the next chapter we propose to treat on the subject of photo-lithographs in half-tone, and this will complete the series.

(*To be continued*).

Correspondence.

VIGNETTING IN THE CAMERA.

Dear Sir,—I notice in Photographic News of the 21st, that Mr. Van der Weyde has taken out a patent for vignetting in the camera, and also from outside, by means of a translucent medium between the sitter and lens, or between the lens and plate. In justice to myself and the profession I must state the following:—At the time M. Lambert was at Greenwich, Mr. J. Hughes and myself took out licenses to work the chromotype process, but on my return to Bath I found it very difficult to make vignettes by that process; so I set to work to make my vignettes on the negatives in the camera, and constructed a similar arrangement, which answered my purpose so well that I sent a print to Mr. Hughes to see, with which he was much pleased. Why I did not adopt it then, I found it difficult in getting, by the wet process, the even tint required; but by the dry plate that difficulty is removed. I have this summer made some improvement, and so made it easier to work, and shall now adopt it generally. You will see by the enclosed print and negative, that the style of hair is of the date of M. Lambert's introducing chromotype.—Yours truly,

Henry Lambert.

LANTERN SLIDE CLUB.

Sir,—I have received several replies from gentlemen desirous of joining the Club, and should like to have a few more, especially from those living in London.

Mr. Brooks, in his letter last week, opens out a pretentious line to that I have in view. I do not propose any educational, or social, or discussional club, but simply and only the utilitarian idea of co-operation, whereby each member of a small and select body may be able, at the cost of fifty good slides, to have the loan of (say) one thousand, and still remain the possessor of his own fifty. Of course, it is open to any one to get up a club on any wider basis,

but it seems to me that the lantern is such a merely mechanical affair, and the making of slides is so simple a matter, that a society formed for the study of making lantern slides, and all matters connected with the lantern, would be of a dubious advantage. There is nothing very abstruse in lantern matters, and the making of slides is carried on as a business, while the making of slides from one's ones own negatives is simplicity itself, as far as the actual work of making the slides themselves is concerned.

At the same time, there would be a very tangible basis for a lantern club with periodical meetings to show the efforts of the members on the screen, and the other objects indicated; but I personally, though I should like to belong to it, would not be prepared to give the time needful for the successful working.

My idea is merely a co-operative arrangement for the exchange of slides for use at members' own homes, or for a joint stock of slides, and for this a few more members are wanted.

Proposed Constitution of Lantern Slide Exchange.

The object of the Club to be co-operation by a limited number of members to procure first-class slides at a reduced rate.

Each member on joining to pay an entrance fee of £2, to be devoted to the purchase of slides in sets of fifty, and also suitable boxes for their safe dispatch by Parcels Post.

Any member leaving the Club to withdraw the slides purchased with his entrance fee, and his place to be taken by an additional new member.

There shall be an annual subscription of 10s. to pay the ordinary working expenses of the Club, and to purchase extra slides should there be any surplus.

Each member be entitled to the loan of fifty slides every week, but no member be allowed to have a succeeding set until the set last borrowed is returned to the Hon. Secretary.

The Hon. Sec. to keep a record of the slides standing to the credit of each member, and also a book recording the dates of loan and return of the slides.

Each member at the outset to pay the carriage to and fro of the slides he borrows; but this may possibly be modified later on.

Although, *prima facie*, one particular set of slides would be regarded as the property of each individual member, should that member detain any other set, his claim to the set standing against his name would lapse; the latter set being, in that case, placed to the credit of the member whose slides had been wrongfully detained, and the defaulting member would be severed from the membership.

Any member leaving the Club to lose all claim to the accumulated slides, save only the single set representing his original entrance fee.

Members to make good any fractures while slides are in their possession.

This is the rough idea I have in view in the first instance, and it can readily be seen that an immediate start can be made. Possibly later on additional features can be added, but at present I do not see my way to do more. It is a purely utilitarian idea by which we may have the run of a number of slides at the cost of a few; and the Association will be so constituted that any member can leave when he likes by keeping the set of slides represented by his own entrance fee.

I should of course give the members sufficient assurance of my stability and position to satisfy them that I should not "clear off" with the slides; and I should, so long as I managed the affair, take care that no member secured more than the allotted number of slides at one time. I could not undertake to conduct a Club numbering more than, at most, twenty-five members at present; but, of course, it is quite open to any one else to start a similar club if he feels so disposed.—Yours faithfully,

River Cottage, Hornsey, N. HENRY SMITH.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 11th inst., Mr. J. HEINRICH TRINKS in the chair.

Mr. J. GORDON exhibited and explained the action of a print-washing machine designed by Mr. Sturrock, of Dundee. The characteristic features are—isolation of prints during soaking by means of a series of trays, fixed period for draining between emptying and refilling, and syphoning at any desired interval from one to twenty times per hour.

Mr. W. E. DEBENHAM spoke favourably of the apparatus, and said that less water was required—an important consideration in many studios.

The CHAIRMAN, having thanked Mr. Gordon, passed to the principal business of the evening, Mr. Debenham's lecturette (see page 804), which Mr. Debenham read, fully illustrating his contentions by diagrams on the black-board.

In the discussion which followed, Mr. F. W. HART said some years ago he constructed a polygonal frame four feet in diameter, fitted with sixteen mirrors, for copying Daguerreotypes and glass positives; he obtained an enormous illumination, which resulted in a bright picture without reflection.

Mr. DEBENHAM said such an arrangement came very near to what was desired.

Mr. A. L. HENDERSON thought the screen mentioned by the Lecturer would intercept too much light when it became necessary to enlarge considerably with the lens near the object; in other cases there would be reflection at the edges. He then spoke of the probable advantages to be gained by using a sort of vista-scope, also Mr. Hughes's muslin screen for avoiding granularity, and concluded by describing his own method for centering the picture, which consisted in fixing a scale of numbers on the camera-stand, and another on the studio wall, the indexes being made parallel.

Mr. W. K. BURTON enquired if the Lecturer had any special reason for selecting the back combination of a portrait lens in the special case he had spoken of, as some held that there was a difference, although he could not see why they should.

Mr. J. BARKER made better copies of paper prints when glass intervened, and the closer to the picture the better the copy.

Mr. A. HADDON advocated soaking in water, and mounting in optical contact.

Mr. S. C. SALMON enquired if Mr. Debenham had any objections to putting the picture to be copied at the bottom of a box, and copying in that manner.

Mr. J. J. BRIGINSHAW preferred copying in open air.

Mr. DEBENHAM, replying, said Mr. Henderson would find it more convenient to mark the wall only, having a series of numbers running above and below the centre. Mr. Hughes's muslin screen was referred to in the lecture as tissue paper. If the screen were placed as shown in the diagram, the angle included the rays which caused reflection at the edges. His object in using the combination spoken of, was to get a blurred effect. Copying through glass keeps the print flat, and there is less chance of dust. For optical contact, wetting the print is necessary, and he observed chalkiness or want of tone in the lights to be the result. Copying at the bottom of the box had objections out-weighing the benefits; unless the box be twice the size of the picture, the angle of light reaching the picture would be such as he had shown caused reflection.

Mr. A. COWAN could not agree that the dark side of the studio was always the best for copying, and sketched on the black-board the arrangement employed by him, and which enabled him to move anywhere about the room.

Mr. W. H. PRESTWICH said granularity depended much on the positon of a print during copying; the texture would be seen to run in a certain direction, much after the fashion of buff lines in a Daguerreotype plate.

The avoidance of vibration in copying then became the subject of conversation, the CHAIRMAN warmly advocating the German system of swinging platforms which had been so efficiently illustrated by the late Mr. H. Baden Pritchard in his "Studios of Europe."

A hearty vote of thanks was then passed to Mr. Debenham for his interesting paper.

The CHAIRMAN then introduced Mr. E. Sollas, who gave an interesting account of photographic work in Yellowstone Park, U.S.A., and showed some very good results. He said the difficulties were great, and the camps being fifty miles apart would not

allow very long for choosing subjects. As an artist he thought photographs were usually made too sharp; the softer prints, which were often thrown aside, he much preferred for their artistic qualities.

Mr. W. Wright was elected a member.

The next lecturette, on Jan. 8th, will be "Experiences in Taking Instantaneous Views of London," by Mr. W. Cobb.

PHOTOGRAPHIC SOCIETY OF IRELAND.

THE usual monthly meeting of this Society was held in the Royal College of Science, Stephen's Green, E., on Friday, the 12th inst., Mr. Thomas A. BEWLEY in the chair. The minutes of the previous meeting having been read and confirmed, Mr. Frederick H. Campbell was elected a member. The Chairman then called on

Mr. GEORGE MANSFIELD for his communication "On Paper Negatives." In the course of his paper Mr. Mansfield drew attention to the old method of producing negatives on paper, and then waxing the material to render them translucid; and then gave a most interesting account of his recent experiments with various gelatino-bromide papers, both on what is known as "negative" as well as "positive" papers—those produced on the "positive" paper yielding in his hands the best results, while the "negative" paper gave the most trouble in rendering it translucid, on account of its extra thickness. He also handed round several excellent negatives and prints off 10 by 12 and whole plate size, the difference between the prints and those off ordinary plates being hardly distinguishable.

In the debate which followed, Mr. J. V. ROBINSON ventured to predict that the future basis on which all negative films would be held would be the material now brought under the notice of the meeting, the great advantage to be gained being the lessening of the weight to be carried by doing away with the glasses which at the present stage of photography are indispensable. Mr. Robinson also exhibited a most interesting collection of old waxed negatives, which for brilliancy and delicacy of detail were hardly to be beaten even by gelatino-bromide plates, or the still older collodion films.

Dr. SCOTT, who has also been experimenting in the same direction as Mr. Mansfield, detailed the results he had obtained, and passed round several negatives and prints, as also an instantaneous view of Kingstown Harbour, which was highly creditable as instancing the results this paper is capable of yielding.

Mr. WOODWORTH also exhibited a collection of paper negatives enlarged from quarter-plate transparencies, and some platinum prints from same.

The next meeting is intended to be held Jan. 9th, 1885.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.

THE ordinary meeting of the above Association was held on Tuesday, the 9th inst., in the College of Physical Science, Newcastle, at half-past seven o'clock p.m., Mr. P. M. LAWS in the chair.

The minutes were read and passed.

The CHAIRMAN announced that the Council had decided to join with the Tyneside Students' Association and three or four other societies in a *conversazione* to be held on the 8th January, and asked members to contribute pictures.

Mr. H. G. TEMPLETON, of Gateshead, read a paper on "The Platinotype Process" (see page 806), and gave a very successful practical demonstration.

Mr. PROCTOR gave some interesting details of the method he had adopted in taking his view without a lens, shown at the Society's recent Exhibition. The pictures taken late in October had fifteen minutes' exposure, the distance between the plate and aperture being about twelve inches.

A vote of thanks to the Chairman concluded the meeting.

CHELTENHAM PHOTOGRAPHIC SOCIETY.

A MEETING of this Society (till recently known as the Cheltenham Amateur Photographic Society) was held on Thursday, Dec. 11, the President, COL. DAWSON, C.B., in the chair.

The following gentlemen were elected members of the Society:—Messrs. White, R. Dighton, W. L. Ferguson, and Joyner.

Mr. BAYNHAM JONES exhibited one of Mr. Kellen's new patent cameras, half-plate size, square, with reversing frame.

Colonel DAWSON then read a short account of a potash and soda developer used by himself for some time with great success; his formula being:—

Carbonate of potash (London Pharm.)...	240 grains
Washing soda	240 „
Potassium bromide	20 „
Dissolved in water to make	20 ounces

This solution contains 3 grains of each article in every drachm. In each ounce of developer one drachm of the above is used with 2 grains of pyro.

Prints were exhibited by several members; those of Mr. Beetham, from negatives taken in the neighbourhood of Torquay, being very much admired.

Some transparencies were also shown.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held at the Manchester Technical Schools, on Thursday, Dec. 11th, the President, Mr. JOHN S. POLLITT, in the chair. The minutes of the previous meeting were read and confirmed.

The following gentlemen were elected members of the Society—viz., Messrs. B. Ellstor, F. Barker, C. Estcourt, F.C.S.

Mr. J. W. LEIGH read a short paper, and gave practical illustrations of several methods of effecting the printing of skies in landscape pictures. Mr. Leigh explained that where, as was often the case, the sky portion of a landscape negatives was defective, the first thing to be done is to screen the sky portion during printing, so as to get a print with a white sky. This he effects by taking a sheet of cardboard and tearing this so as to follow roughly the sky line; this is then attached to the printing-frame by pins, and the whole exposed to diffused light; the sky mask being given a slight curl upwards, does away with any mark or line at the junction. The print is then taken out of the frame and laid on a large sheet of glass, and the cloud negative laid upon it, the right position being easily determined by looking through the negative and print together. To mask the landscape portion of the film, Mr. Leigh places over it one or more pieces of cloth—*e.g.*, the pads from the frame—and rolls these back at the sky line in order to soften the edges, and again exposes to diffused light till the clouds are sufficiently printed. Mr. Leigh also showed a simple plan he made use of when any part of a negative was much thinner than the rest, and would necessarily give an uneven print. He commences the print in the usual way, and as soon as the thin part is done enough, he masks that portion by attaching a tuft of cotton-wool by means of gum to the back of the negative, and pulls out the edges to get the necessary softness. At the conclusion of his paper, Mr. Leigh referred to a question in the question-box at the last meeting, as to the quantity of hypo necessary for a given number of prints; and, quoting from Captain Abney's book, called attention to the necessity of using the hypo solution strong, to ensure perfect fixation, and the complete removal of the hypo during the final washing.

Mr. RISHTON agreed with Mr. Leigh on the hypo question, and remarked that it was desirable to have the fixing bath in an alkaline condition, and he was in the habit of adding ammonia for this purpose.

Mr. ATHERTON said common washing soda answered the purpose equally well, and suggested three ounces of hypo to the pint of water as about the correct amount for fixing one sheet of paper.

The PRESIDENT said he had found the use of tepid water in the final washing a great advantage. Referring to Mr. Leigh's plan of masking with cotton-wool, he had for some years made use of Prussian blue painted on the back of the negative, and softened by dabbing in the usual way. In the printing-frame he had also found it desirable to lay a sheet of thin cardboard next to the sensitive paper, and he found that by this method he obtained complete immunity from cockling of the print in damp weather.

Mr. CHILTON asked the President if warm water for washing prints affected the surface and brilliancy of the print?

The PRESIDENT replied that if the water were used tepid he had never found any ill effects, but if the water were used hot, the prints would certainly suffer.

Mr. GREATOREX asked for information as to the best method of masking a sky in which there was a church steeple, tower, &c.

Mr. LEIGH said he should block the sky out with black varnish.

Mr. MCKELLEN recommended making a print, and cutting out the image of the steeple, &c., and laying the mask so formed on the negative with the smallest quantity of paste.

Mr. ALAN GARNETT showed two very charming prints on Alpha paper, which were much admired. He also exhibited an ingenious

contrivance for the gas jet in an amateur's dark-room by which the gas could be turned apparently out, and on turning the tap up again, the flame at the burner was re-kindled, the small spark kept in being concealed by a metal cap round the jet.

The HON. SECRETARY (Mr. W. J. Chadwick) exhibited a simple contrivance which he made use of when mounting prints on plain boards, remarking that he had frequently seen amateurs fail in getting the print in the centre of the mount or square with it. His plan consisted in using a guide or mask made from one of the mounts in use, in the centre of which an opening is cut $\frac{1}{8}$th of an inch each way larger than the print to be mounted. This mask is laid on the mounting board and attached thereto by a pair of American clips. The print, coated with the mounting medium, is now placed in the opening of the mask, which latter being removed, the print may be rubbed down on its board, and its central position settled upon.

The meeting was then adjourned to the 8th Jan., 1885.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next monthly technical meeting of this Society will take place on Tuesday next, December 23rd, at 8 p.m., at 5A, Pall Mall East.

THE ANNUAL DINNER OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.—On Tuesday evening last this event took place at the Holborn Restaurant, Mr. W. Ackland, President, occupying the chair. There seemed to be a feeling that the Society is about to enter into a period of increased usefulness and activity, the Secretary stating that he had received many promises of interesting papers for the future meetings. Several gentlemen entertained the company with songs and recitations, and it was late when the assembly broke up.

PURIFICATION OF ALBUMEN, AND AN IMPROVED SUBSTRATUM FOR DRY PLATES.—A reader who uses an albumen and water-glass substratum for gelatino-bromide plates, tells us that he finds Dr. Reichart's method of purifying albumen with carbonic acid gas to be excellent; as when the stream of gas is passed through the diluted albumen, the membranous and other impurities settle down rapidly, and the liquid may then be filtered. In order to avoid the trouble of preparing the gas, ordinary "soda water" may be used to dilute the albumen; there being quite enough carbonic acid gas present for the purpose. Here is the formula for a substratum made with the soda water:—

White of two eggs
Soda water ... ... 1 bottle

Beat well and add—

Soda water ... ... 1 bottle

Carefully filter, and—

Make up to 30 ounces with distilled water

Then add—

Soluble silicate of soda ... ... 1 ounce

To use this, flow it over the cleaned plates, and allow the excess to drain off at one corner.

A DROPPING-BOTTLE FOR THE DRY-PLATE DEVELOPER AND A BYE-PASS STOPCOCK FOR THE DARK-ROOM LAMP.—From Messrs. G. Houghton and Son we receive two useful appliances. In the first place, a dropping-bottle of the kind described on page 104 of our present volume, and mentioned by us as coming to hand from Germany; and in the second place, a stopcock, with a bye-pass arrangement by which a small jet of gas is left burning when the principal flame is turned out. This stopcock is furnished with the usual $\frac{3}{8}$ thread (brass), and can be screwed on the ordinary fittings. It may be mentioned that the reserve jet which is fed by the bye-pass is screened by a shield, so that no light can be seen.

OPENING OF THE NEW ORLEANS EXHIBITION.—At the opening ceremony on Tuesday last, the Exhibition buildings, which cover more than sixty acres, were crowded in every part. President Arthur declared it open, and started the machinery by telegraph, direct communication being established between the White House and the Exhibition, and when the great engines commenced to move, the whole became active and animated. The Exhibition is, however, far from complete, as many of the exhibits are not yet unpacked. There are many exhibits of photographic interest, especially the north gallery and east section. Mr. E. L. Wilson is superintendent of the photographic department.

DEATH OF PROFESSOR KOLBE.—This distinguished chemist expired on the 25th of last month, and his contributions to scientific chemistry will long be remembered; indeed, modern chemical theories of organic chemistry, as based on the supposed self-saturating properties of the carbon atom, may be regarded as mainly the outcome of Kolbe's investigations and writings.

MR. GORHAM'S PUPIL PHOTOMETER.—It should have been stated that the article on p. 793 is reprinted from *Knowledge*.

To Correspondents.

*** We cannot undertake to return rejected communications.

*** NOTICE TO ADVERTISERS.—Advertisements intended for insertion in the issue of the PHOTOGRAPHIC NEWS of December 26th, should reach the Publishers not later than noon on Tuesday, December 23rd.

A. J. H.—1. About forty cells of the Bunsen battery. 2. The cost of the former would be at least double.

K. A. B.—The address of the Company is 31, Farringdon Street.

A. G. BROPHY.—1. It will keep for a few weeks, but not so long as the best samples of ready-sensitized paper. 2. No, the result will be an emulsion of less sensitiveness. 3. It is equally efficient, but hardly so convenient.

THOS. E. SANSOM.—1. By the selection of a suitable kind of gelatine, and by avoiding air-currents during the period of drying. The addition of plaster of Paris is not advisable, but you may add a little of the finely-ground sulpqate of baryta, which is sold as "mountain snow" or "permanent white." The thinner the film, the less the relief. 2. You can strip the gelatine negatives by the method of Mr. Plener, (see page 465 of the present volume.) 3. We do not know of any good method. 4. No, it is useless, you should obtain a clear and hard gelatine.

H. SPINKS.—It simply means this: that 98 parts of bromide of ammonium will decompose the same amount of nitrate of silver as 119 parts of bromide of potassium, but we do not see that this will help you much in compounding what you require. 2. It seems to us that it is rather in using it and adapting it to the exposure of each plate, than in originally compounding it, that the difficulty steps in. 3. We shall be very glad to see it, and will take an early opportunity of doing so.

GEORGE SMITH.—Unless under very exceptional circumstances, we should not think of publishing letters addressed to other persons; consequently, we are obliged to omit those you send.

PACO.—1. Probably that of Rossignol, described on page 756. No doubt you can obtain it through Messrs. Marion and Co. 2. Not when the views are taken from the street, or from private premises; but there are, in many cases, regulations against photographing in parks and public gardens without permission. The gate-keepers or persons in charge will always give information as to whom to apply to, and there is seldom any difficulty in obtaining permission. 3. This depends on special circumstances; but we may mention that a permit to photograph in Kew Gardens is often available for twelve months, but only during the time when the Gardens are closed to the general public. We are always very pleased to give our correspondents any information in our power, or to endeavour to obtain information for them.

F. STANLEY.—The best method is to burn a weighed portion of the cuttings, and to fuse the ash with twice its weight of dry carbonate of soda. A white heat is required, but in the case of a small quantity, it is sufficient to keep the mass in a state of fusion for ten minutes.

W. A. O.—You can copy it on a reduced scale, but the camera will not expand to a sufficient length to enable you to make a reproduction of the same size as the original. You can, however, fit a conical extension-piece to the front of the camera. Thank you for the paper, of which we shall make use.

A. L. T. H. HAAKMAN.—We will endeavour to obtain the best information on the subject, and will write to you.

BOX.—A few words on the subject in this column would be of no use to you, but we will treat of it in a special article before long.

POLISH.—The best is the so-called encaustic paste—

Best white wax ... ... 1 ounce
Turpentine ... ... 5 ounces

Melt together with a gentle heat.

QUANDARY.—From the appearance of your samples, we think it likely that the mischief arises from the presence of some deleterious material in the mounts. Cut some prints in two pieces, and mount one set of halves on the mounts now in use, and the other set on mounts such as you have used before. Now keep all the samples under similar conditions, and if those on the fresh mounts should fade, make a claim for damages against the firm supplying the cards.

GEO. N. FELL.—Make a solution containing sixty grains to the ounce, and add two drops or more of this to each ounce of the solution, according to the extent of the over-exposure.

WOLL.—Add one drop of sulphuric acid to each three or four ounces of the iron solution, and use it while fresh. Thank you for the cards; we shall make use of them, and of your letter.

THE PHOTOGRAPHIC NEWS.

VOL. XXVIII. No. 1373.—*December 26, 1884.*

CONTENTS.

SENDING OUT PROOFS.

THERE are many photographers who think that anything will do for a proof, and photographers adopt various methods of sending samples of their work to their customers. Some there are who send out proof prints as they come from the printing frame; the negatives untouched, the prints untoned and not fixed, with but a few minutes' life if shown to the light. Everything is done to convince the sitter that the operator has a thorough contempt for his own work, and is scarcely in a position to appreciate the characteristic expression and the graceful pose, if these desirable qualities exist. How are the friends of the sitter to judge of a print which is—

"Like the snow-fall on the river,
A moment white, then gone for ever?"

How can any reasonable photographer expect to get orders for copies under these circumstances? Others tone, fix, and trim their proofs, but send them unmounted, and from untouched negatives, accompanied by a printed label stating that if any of the proofs are considered satisfactory, the negatives will be retouched. This, we believe, is the practice of a large number of photographers; but the curled-up, unmounted prints do not give the sitter a fair chance of judging them; consequently, those who take a pride in their work go further than this, and send out their proofs, or the best of them, completely finished; and they are indeed wise in going to the extra trouble and expense, for the finest sample must *always* bring in the largest order.

We have inquired regarding the sending out of proofs of many photographers, and give the method of two of them whose studios are well-known in the profession as model establishments. The one is in London, the other in the country.

The London photographer sends two or three proofs, one of them completely retouched, the other partly so; accompanying them is the following circular:—

"Mr. A—— begs to enclose proofs of Miss —— photographs.

"It is particularly requested *that all* the copies may be returned, and the numbers required from each selected position stated on the reverse sides of the chosen proofs."

There is also sent another printed slip as follows:—

"*Re-Sittings.*

"Should a re-sitting be desired because of an unsatisfactory expression, unsuitable dress, or in consequence of any defect for which Mr. A—— cannot be held responsible, half the fee will be charged for the second sitting; for which sum, however, half the number of copies will be sent in addition to the original order."

"*Sale of Photographs.*

"As it is Mr. A——'s strict rule never to publish portraits of private individuals, copies of these photographs will on no account be sold to anyone applying for the same without the direct written authority of the sitter."

There is no price mentioned, an omission which is not made by our next example. We fear, also, that the paragraph touching re-sittings is a direct invitation to his sitter to—shall we say?—sympathise with Ananias, or at all events to try to prove that the necessity for a re-sitting was not caused by any fault of his own.

Mr. B——, we believe, grants re-sittings without making any inquiry as to whose fault it was that made one necessary. He only desires to know what is objected to, and asks for any suggestions for alterations. These questions, he informs us, in connection with the paragraph on his envelope printed below, which is intended to frustrate the wicked designs of those who scheme to obtain a quantity of proofs to select from, often saves re-sittings, which he finds he gives to the extent of four per cent. of the number of persons who sit to him—not a very extravagant quantity.

Mr. B—— sends several proofs, all mounted on plain mounts. One only of the negatives is retouched, and the following label is affixed to the print from it:—

"Mr. B—— has retouched the enclosed Portrait much more highly than the rest. If any of the others should be preferred in expression or general effect, the order can be given from them, and they can, if required, be finished in the same manner."

The whole of the proofs are sent in an envelope on which is printed something to the following effect, the prices, of course, varying according to the size and style of the portraits.

Cabinet Portraits.

"The portraits in this envelope are eight for £1 1s., one dozen for £1 8s. 6d., two dozen for £2 10s., fifty for £4 10s.

"The whole number required may be ordered from one, or made up from several of the enclosed proofs.

"Proofs not approved may be returned or counted in the number required."

☞ If a re-sitting is desired, the proofs now submitted must be returned and destroyed before the second sitting is given.

This method of sending proofs is very plain and straightforward. The list of prices not only prevents disagreeable mistakes, but the "reduction on taking a quantity" often induces a larger order than would otherwise have been given.

DEATH OF MR. HENRY GREENWOOD.

WE are pained to have to record the death of Mr. Greenwood, of Liverpool, a gentleman well known in photographic circles as the founder, printer, and proprietor of the *British Journal of Photography*. He also established the *Liverpool Journal of Commerce*. Mr. Greenwood, whose age at the time of his decease was 64, had been ailing during the last few months, but the end came very suddenly

at an early hour on Tuesday morning, the 16th inst.; he having transacted business up to a late hour on Monday night.

NORTHAMPTON PHOTOGRAPHIC EXHIBITION.

Second Notice.

On looking round the walls of the well-lit Gallery, formerly the home of the Northampton Museum, one cannot help being struck by the number of old favourites that meet the eye at every turn; but, of course, this of necessity must happen where there is no restriction as to prior exhibition, and would apply to all the country photographic exhibitions which have of late become so popular. Several of the pictures lately on the walls at Pall Mall have gained immensely by the capital light in which they are seen, notably "The Cuckoo" (112), by H. P. Robinson. This very beautiful composition was skied in Pall Mall; but here it is well hung, and in consequence all its merits are offered to the eye without difficulty: the result is an old friend with quite a new face.

We will now proceed to make a tour of the Gallery, and in our review of the pictures will follow the order of the catalogue. A striking frame of Boudoir portraits (4), by J. Lafayette, arrests the attention. They are very uniform in quality, and technically good.

Near them is a frame of portraits (10), by T. Galloway. The portraits do not call for special mention, but in the frame are two or three studies of a more ambitious character. They are broad in treatment and Rembrandt in effect, and one of them, an old toper, jug in hand, is excellent, and has borrowed its inspiration from the old Dutch masters. "A Cock-and-Bull Story" (12), by Malcolm H. Clark, is an ambitious attempt, and tells its tale fairly well. A bronze medal has been given to "Both Faces," a series of cabinet portraits (13) by F. Greene. The show of small portraits is extremely moderate, and this frame does not call for any particular mention. "Too Late," by Chaffin and Sons, is a capital picture, but has been already described in reviews of former exhibitions. "Under a Shady Tree" (22), by G. Mald, is a group of gipsies, and they are very shady indeed. "The Village Corn Doctor" (25), by F. J. Seed, is a study of peasant life. The expression on the faces is good.

The Rev. B. Holland sends several frames; the best in our estimation being "Paddlers" (29), a group of boys bathing in a shallow winding stream. As a photograph it is a little hard, but is a pleasing picture notwithstanding. "Spanish Imperial Eagle," an enlargement in carbon, by T. J. Dixon (36), is an old friend, but shows extremely well in this gallery.

"Just Let Loose from School" (62), by E. Smithells, is a good photograph, but the grouping is a little formal. "A Study of French and English Partridges" (63), and "A Study of Fish and Moor-hens" (65) may be regarded as a friendly competition between Mr. and Mrs. Payne. They are perfect examples of still life, and both in grouping as well as technical excellence leave nothing to be desired. To the latter, by Mrs. Glen Payne, an extra bronze medal has been awarded.

In frame 66 are a series of views in Derbyshire and Wales, by C. E. Abney. They are small in size, but large in quality, and, taken as examples of artistic selection and manipulative skill, will hold their own against the more pretentious efforts in the Exhibition. J. H. Mendelssohn, in the portrait of Master Newman (68), has scored a great success. It is so gracefully unconscious in pose as only children can be. "Meditation" (169), by T. Whaley, is a very good picture; it is low in tone, but very harmonious. A graceful girl is before a fireplace, in deep thought; the background is well carried out, and in perfect keeping. No. 76, by W. Telf, is a yacht race, and is one of the many capital marine pictures in this Exhibition. A group of three ladies (79) is a capital example of unconventional portraiture by Rupell and Sons. Mrs. W. E. Gladstone and daughter (88) is an extremely good portrait study by T. Fall. "Darby and Joan, Cochin China Prize Birds" (89), by J. Negham, is a very fine carbon enlargement. "Homeward" (90) is a most charming rustic study. It is a three-quarter length figure of a little village maiden, jug in hand. The pose is perfect and the drapery free, and yet well showing the graceful lines of the figure. The background, however, is too prominent, and, being nearly of the same colour as the figure, tends very much to spoil an otherwise very fine picture.

Some large portraits, printed in carbon (9), by Mavius and Vivash, are worthy of notice. They are large heads, and are very forcible, and yet not wanting in delicacy, and though hung far above the line, are very striking, and command attention.

There is an unusually fine collection of Adam Diston's beautiful pictures, all of which are old favourites; but never have they been seen to better advantage. A silver medal has been given to 103, "Out of Sorts; but "Industry," "The Poor of the Village," "Gloaming," and "The Smithy," are all so equally good that the award was practically for the series.

"Bad News" (111), by Malcolm H. Clark, is an ambitious attempt in a worthy direction, and in spite of some shortcomings there is great promise. The scene is well chosen, and great pains have been taken with the costumes of the models; but great knowledge is wanted, as well as special fitness on the part of the photographer, to give the proper animation and expression to the actors of the scene. Practice will do much, and we advise Mr. Clark to go on and prosper.

THE ASSOCIATION OF PHOTOGRAPHIC ASSISTANTS IN VIENNA.

A pamphlet of over fifty pages tells us of the organisation formed in Vienna by the rank-and-file of the photographic workers; and if we may judge by what the Society has done during the past two years, a useful future is before it.

Not only does the Association take means to provide situations for those members requiring them, and afford monetary help to those who have been victims to illness or other misfortune, but it holds monthly meetings, at which photographic topics are discussed, and papers read. Just to give an idea of the activity of the Association in this direction, we may enumerate the subject matters brought forward, or papers read, at three successive meetings—March, April, and May, in this year.

March Meeting.—"Yellow fog on gelatine plates," by L. Grillich; "Exhibition subjects," by Ch. Scolik; "Lighting of the sitter in the studio," by F. Leyde; "Tourist apparatus of ebonite," by J. Czerny; "Digestion apparatus, emulsion filter, electric lighting apparatus for the dark-room, instantaneous shutter, and a collection of views," by Lieut. L. David; "Illustration of Eder's reducing method," by R. Hamsa; "Collection of supplements issued with photographic publications," by the Committee.

April Meeting.—"Report on Kopecky's reduction method," by the Committee; "Hints on work away from home," by A. Schild; "Retouching," by F. Hejda; "Photographic decoration," by H. Möser; "Lighting studies," by A. Schild; "A collection of photographs from Singapore," by F. Skalnik.

May Meeting.—"Demonstration of Henderson's emulsion process," by Gelpke and Scolik; "A quick shutter," by R. Scalla; "A collection of photographic colour-prints," by F. Leyde; "Photo-engravings," by C. Scolik; "A pocket dark room lamp," by J. F. Schaschek; "Instantaneous pictures," by K. Schierer.

Another good feature is the lending-library, which now contains the most important standard works on photo-

graphic subjects, together with the principal photographic publications.

As regards money matters, the Vienna Association appears to be, not only in a thoroughly solvent condition, but to have funds to spare: as apart from the regular contributions of over two hundred members, it receives liberal yearly contributions from nearly all the large photographic firms in Vienna.

The Photographers' Benevolent Association of London would require many modifications and changes to make it as useful and efficient as the Vienna Society; but it is worth while for the Committee to consider how far it may be possible to endeavour to make the Society a closer bond of union among assistants, by providing them with the means of culture and improvement as regards the technical or artistic aspects of their occupation. It is by no means improbable that if the Benevolent Association were to extend its operations to the limits embraced by the Vienna Society, it would meet with increased support.

In speaking of the *brochure* referred to at the beginning of the article, we omitted to mention the excellent collotypic print which accompanies it. The collotype is from the establishment of Herr Eduard Türk, of Vienna, and consists of a grouping of the portraits of the Committee; that of Herr Hans Lenhard, the President, occupying the central position.

AN ARTIST ADVERTISING FOR PRETTY BABIES.

The *New York Tribune* says:—

"Hegger, the artist, advertised for some pretty babies the other day, and at the appointed hour a dozen or more nurses appeared at his studio, each leading or carrying a child. To a casual observer they were a pretty lot, the babies, and one could not but wonder why they all were children of wealthy parents, for their dress plainly indicated that they were. Mr. Hegger came in, and, in his brisk business-like manner, began a survey of the little group, gently removing or pushing back the bonnets, caps, and hoods, so that he might fairly see the faces. He completed the inspection in ten minutes, said none of the children would do, and sent them away, many of the nurses evidently disappointed at his poor taste.

"'What were you looking for in those babies?' a friend asked of the artist.

"'I was hoping to find a pair of eyes large and wide apart, a short upper lip, regular nose and ears, and an oval chin. I was disappointed. Will have to try again.'

"There were some pretty children among the number, but not one that would make a good picture. No one but an expert can imagine how difficult it is to find a baby that will answer the purposes of the photographer. They are compelled to take the countenance in detail, and there is a certain combination of features that makes a handsomer picture than all others. It is not always the prettiest face that makes the prettiest picture. Oftentimes the unattractive baby in rags is the ideal that all artists are searching for, and only an artist would ever discover its beauty."

ISOCHROMATIC PLATES.

With reference to the making of isochromatic plates with chlorophyl, Mr. Ives writes as follows:—

"Having just tested some of the blue-myrtle chlorophyl solution which was made up six weeks ago, and left in the bottle with leaves and some zinc powder, I find it works exactly as good as when fresh. I have often used a two-months old solution, which was kept without the zinc powder, but it always required two or three times more exposure, and showed relatively less colour sensitiveness, necessitating the use of a deeper coloured yellow screen. I find the solution made up with fresh leaves, and the addition of zinc powder, not only keeps good, but gives the best effects with a much lighter yellow screen than I formerly used.

You may remember I expressed a belief that the colour sensitiveness of isochromatic plates was due to a chemical change, and not to the mere colouration of the silver bromide. One proof of this is the fact discovered by me six years ago, that a collodio-bromide plate treated with an infusion of black tea, when exposed through the yellow screen, shows the same colour-sensitiveness as with eosine, giving even better (clearer) negatives, but requiring longer exposure. The tea organifier, after standing on the plate about a minute, must be washed out as thoroughly as possible (like eosine) to give the greatest sensitiveness, and it does not colour the silver bromide at all. The experiment has no value, except to show that the colour-sensitiveness depends upon a chemical change, because chlorophyl gives so much greater sensitiveness to colour that no one who knows its value will use either tea or eosine.

"I have only recently learned that the evergreen plant here known as 'blue myrtle,' is in some localities called 'periwinkle.' I find it described under that name in Chamber's *Encyclopedia*, which gives the botanical name *Vinca Minor*."

Details of Mr. Ives' process of isochromatic photography with plates stained by the chlorophyl of the blue myrtle, will be found on page 566 of the present volume; also in the Year-Book, where a striking example-print is given. The print consists of two reproductions of a chromo-lithograph, one on an ordinary plate, and the other on a chlorophyl plate.

CHAPTERS IN PHOTOGRAPHIC HISTORY.

BY FRANK BISHOP.

A representative of the *Pall Mall Gazette* has interviewed Mr. Bishop, and thus reports what this gentleman says:—

"So you want me to begin at the beginning, do you?" "Well, it is a long story, and I won't go into details about who did or who did not discover the art. That is ancient history, but I will begin with the introduction of the carte-de-visite, which was undoubtedly the great popularizer of photography. About twenty-five years ago, a Parisian photographer conceived the idea of printing the portrait of a person upon a visiting card instead of the mere name, and when he carried his idea into execution it was adopted by all the *élite* of Paris. Instead of the ordinary visiting card, a small portrait of the visitor was handed in, and hence the name carte-de-visite, which, as you know, is still used to describe the smaller kind of portraits. Very soon it became fashionable to make collections of these cards, and as people became more and more curious to see pictures of great men and handsome women, they were exposed for sale in the publishers' windows, and birth was given to a trade which has now developed to such an enormous extent, that it is impossible to estimate it. We ourselves were the publishers who introduced the carte-de-visite in England; but as the demand increased—and it did increase to such an extent that it was quite impossible to meet it—other publishers took up the trade, and the sale went on merrily. Portraits of people whom the purchasers knew nothing whatever about were eagerly bought up. It was the proper thing then to have a collection of these particular pictures, and it mattered little who the originals were." "How did the portraits come to be public property?" "Well, in this way. If a photographer was known to have taken the portrait of any member of the Royal family, or of any notable person, and he could succeed in getting permission to publish that portrait, our policy was to make arrangements with the photographer at once, and secure the monopoly of the sale. In this way we purchased £27,000 worth of portraits from one London firm alone during the first three or four years.

"When any great event happened, then was the time for the photographers. On the death of the Prince Consort, the rush for photographs was something enormous; and again, when the Prince of Wales brought his Royal bride to England, there was a perfect *furore*; it was impossible to print their portraits fast enough. And here I should like to say how much the latter-day photographers are indebted to the Prince of Wales. I know of many cases where he has put himself out of the way to give them

a good sitting, and expressed a hope that the picture would be a successful one from the photographer's own particular point of view. This is no foolish vanity of his: nothing more than a kindly desire to oblige. Some people, when photographs were first published, were always 'sitting,' and took a delight in it. Others were very difficult to get. Lord Brougham, for instance, was continually sitting for his portrait, and if he passed a shop window in which his photograph was exhibited, he would go inside and ask how they were selling. Mr. Disraeli, on the other hand, was very coy. He had a decided objection to being photographed. His wife over and over again urged him to have it taken, and the carriage was many times brought to the door, but he would at the last moment make some excuse about want of time, and then there would be another disappointment. At last the importunity of his wife prevailed, and Mr. Disraeli was driven off to Miall's, and successfully photographed, though sorely against his will.

"About ten years after the introduction of the carte-de-visite, the cabinet size portrait came into use, and that is now the popular size, although the recently-introduced panel-shape and promenade kinds are in great favour among the wealthy folks. The little carte portrait to-day receives its chief support from the poorer classes, and large numbers are still distributed by what is called the club system. Only a few days ago we supplied one well-known photographic firm in London with 2,000,000 cards to mount their 'club' carte-de-visite portraits 'upon.' Photographic views, when originally introduced, were generally large and very expensive. When the carte-de-visite mania, however, was at its height, large numbers of smaller views were sold, while in the shape of stereoscopic slides they were produced by the million. Now we absolutely cannot sell this kind of photograph. They were crushed out of the market by the productions of unscrupulous men who flooded the trade with vulgar, brutal subjects. Latterly, as in the case of portraits, larger views are in demand, and the excellence and beauty to which photography has been brought was, as you say, very clearly shown at the Photographic Exhibition in Pall Mall. English photographers always stood pre-eminent for the excellence of their landscapes, and foreigners could in no way approach them; but in portraiture the reverse held good. Paris led the way for excellence and artistic production; then Vienna came to the front; and at last Sarony, of New York, stood first. But within the last few years the English photographers have forced themselves into the front place in portraiture, as they have always done, and still do, in landscape work.

"You ask me about photography among amateurs. I could say a good deal upon that subject, for the recent improvements in the art have rendered the study of photography one of the easiest, as certainly it is one of the pleasantest, studies it is possible to find. Amateur work may be said to owe its existence to the introduction of dry plates, and especially to the Britannia plates, because they are easy to work and develop so readily. Apart from the vast number of persons who use photography merely for an amusement, there is scarcely any set of professional men that does not include amateur photographers, who find a pursuit of the study something more than a pleasure. It is taught to the soldier and the naval man in our military and naval colleges; the painter makes use of it, though he does not always let it be known; the architect and the engineer find it invaluable; by its means the medical man records typical cases as they come under his notice; and outside the professions ladies, as well as gentlemen, can pursue the study with success at the very outset of their experiments. For an expenditure of 45s., one can buy everything that is necessary for a young beginner to take portraits and landscapes with little or no tuition, and to those who can afford to spend more money, there are all kinds of useful and convenient appliances. The pedestrian may go off in search of the beautiful with a little 'Academy' camera in his pocket, the miniature plates, all ready for exposure, being conveniently carried in the camera itself; the tricyclist may take a more elaborate set, and since the plates have only to be exposed and then replaced in the dark box to be developed at some future time—six months hence, if needs be—photography may now be said to be within the reach of all. Lessons are given free to purchasers, although very little tuition is needed. Look at this scrap-book and you will be convinced. There are some very good landscape views which were taken by Sir Henry Bessemer's grandson with a cheap set of materials, and his first dozen plates. So you see what was once a very impracticable study for any but professional men, is now an eminently practical one, and within the reach of everybody—ladies as well as gentlemen, and young people too. Depend upon it, the next two or three years will see a wonderful development of photography among amateurs."

HINTS ON POSING AND THE MANAGEMENT OF THE SITTER.

BY H. P. ROBINSON.

Chapter X.—Suggestion and Interference in Posing.

The photographer is often annoyed by the ridiculous suggestions made by the friends of the sitter, and sometimes by the sitter himself, although the latter oftener takes the character of a hopeless victim.

It is a question how far such interference is to be tolerated, and how it is to be met?

Many photographers object to their sitters being accompanied by a friend, and prefer to have them to themselves. I do not agree with this exclusion, and always welcome the presence of one or two of the sitter's friends, if they are not fussy people, and gladly accept their hints and suggestions if they are made at the proper time—that is, before I begin to pose the model; any interference after I have begun is sure to do mischief. Everything depends upon the temperament of the sitter. She—it is the ladies usually who object to come alone—may like to have a friend with her to give her confidence, but prefers not to be looked at as the exposure is going on. It is always easy to manage in a case of this sort. The friend may turn away her head, or sit behind a curtain; in my own place I have a sort of ante-room to the studio, made attractive and comfortable, into which I send the friends when I find they are doing mischief by remaining in the studio. This is sufficiently near to satisfy the most nervous sitter, and they do not interfere with the operation. It is the practice of some photographers not to permit any one to be present, but it is not wise to draw a hard-and-fast line. It should be absolutely at the sitter's choice whether friends should be present or not; it is surely better to humour the sitter and get a good portrait, than to have your own way entirely and an inferior production. But when the friends have left the studio they should remain away until the exposure has taken place. Nothing is more disturbing than people going in and out. Above all, never allow peeping. Friends will sometimes go away, and then creep quietly back and peep through the door or through a curtain. Nothing could be more calculated to make the sitter nervous than this sort of thing, and it quite prevents all endeavours to try what might be called experimental expression. Sitters are often inclined to think they lose dignity if they do not look dignified. It is often possible to talk them into a genial state, or get them to act the part—"assume a virtue if they have it not"—but this is quite out of the question if you or the sitter feels all the time that there is some one taking a surreptitious peep, and listening to all that is said.

Having made it clear that I do not object to two or three of the friends of the sitter being present, let us see how far these visitors are to be allowed to interfere.

Information is always valuable, and any information a photographer can get he should be thankful for, and use at his discretion. Of course, the size and style of the picture required has been settled in the reception room; but it is often of great advantage to get some further knowledge than can be obtained at first sight of your subject. It is well to know if former photographers have failed, and why. Was it expression, pose, dress, bad photography, or what? Useful hints of what to avoid can be easily gathered, and you may learn what is best to be done by judicious conversation; you should also find out the sort of thing that would be likely to please, such as any characteristic attitude or expression. All this will aid you in getting a picture that the friends will declare is "*so* like." I need not say that you should find out whether a sitting or standing pose would be preferred. It often happens that after the operator has taken the number of

negatives he thinks necessary or desirable to use in the particular case, and the job is, in fact, finished, some kind friend will suggest that she should so like to have "one in a hat." This you would have been very glad to do if you had known in time, but it is difficult to refuse, and you expose another plate. This might have been avoided if proper enquiries had been made at the outset.

Then there are those who want to see the pose, and will promise to go away when you are ready. These people are not easy to deal with. It is difficult to explain to them before the sitter that you may possibly want to surprise her into a characteristic attitude or expression; that would be to expose your carefully masked plot, and moreover, if you do let them stay, they will, perhaps, not go at the last minute, and the sitter will feel constrained, and tire while you are getting them out. My rule is, in *or* out, just as the sitter pleases, but not in *and* out on any pretext.

There are some people who are quite irrepressible. They promise not to interfere, and mean to keep their promise, but for all that jump up just as the cap is about to be removed from the lens, to alter a bit of drapery or set a lock of hair straight, or to make a brilliant suggestion, such as that the pose of the hands might be improved—when you are taking the head only! They knew very well that the hands would not be in the picture, but such people cannot restrain themselves, and should be got rid of if possible. When these vexing little incidents occur it is better to break off, make the sitter walk round the room, and begin again.

Some sitters will bring a friend to pose them. "It is such an an advantage, you know, to have the assistance of an artist," they will perhaps insult you by saying, on the strength of their friend having passed the second grade examination in free-hand, or copied some smudgy flowers on terra-cotta, but who, nevertheless, has never heard of composition. Of all the irritating assistance the photographer has offered to him, that of the amateur artist is the most difficult to accept smiling—or, perhaps, I should say, *without* smiling. The highly-trained artist is bad enough, as I shall presently show, but the combined ignorance and assurance of the amateur is quite fatal.

Then there are those who kindly endeavour to teach you your business—who explain that hands come large if placed too forward; that blue photographs badly, that yellow does not "take," and that photographs taken abroad are better than those done in this country because the light is clearer; and, finally, those who prefer to give you their instructions in learned words suited to the occasion, just as they would talk to a foreigner in his own tongue—and puzzle him. These wise ones want their portrait to be "a small focus," or "a large focus," and are surprised if you tell them that there are no different sizes of focus, and that focus has no other dimension than length.

How much help you are to admit in dealing with young folks, I have alluded to incidentally in the chapter on photographing children. It is quite impossible to get on if children are accompanied by a troop of friends, especially lively grandfathers and grandmothers. A father may sometimes be admitted if he be of an exceptional sort, but even in his case it is better to keep him in reserve for use if the usual means fail. Nine out of ten mothers are useful, but the tenth should be kept out of the studio. A nurse who knows her business is the best help you can have. Even she will sometimes want a standing portrait of a ten-month old baby, but it is easier to tell the nurse she is an idiot, than the mother.

It might be thought that artists, and those who have been trained to art, would be able to give very efficient advice in the studio; but I have found it quite to the contrary, and this invariably. Even experienced portrait painters are very much at a loss how to pose a sitter for the photographer, although they may require the photograph for their own use, and may have had time to consider the matter. The fact is, that painters are in the habit of going about their work in a more leisurely manner than photographers, and cannot pose quickly. They find it to their advantage to go quietly to work, as they can call up expression when they want it, or leave it to a future sitting; while the photographer knows that if he harrasses his sitter too much, he knocks the life out of him. Yet there are some photographers who gladly accept the aid of a brother artist if he can prove that he really is skilful in his business.

There is a story, that once upon a time, when an illustrious prince and his noble entertainer returned from deer stalking, they sent for a photographer to make a pictorial record of their successful day's sport. When the stags were being arranged, Sir Edwin Landseer, who was present, made some suggestions for the improvement of the composition of the group. The photographer resented this interference, declaring that he could not get on if those who knew nothing about art altered his arrangements. "But I am Sir Edwin Landseer," said the great artist; "surely you know my pictures." "Oh! if you are in the trade it is all right," replied the photographer, and gladly accepted Sir Edwin's assistance.

To conclude. Be strong, but hide your strength; be gentle in manner, but vigorous in the deed; make up your mind what you mean to do, and do it. If your sitter or her friends think all the credit is due to themselves, let them think so. It pleases them and does not hurt you; in fact, it is in your favour, for they will like the picture all the better if they fancy its merits are due to their own valuable suggestions.

MORE ABOUT THE SODA DEVELOPER.

BY W. M. ASHMAN.

The necessity of being always prepared to develop a gelatine plate with absolute certainty, and at the same time obtain the most perfect results, is apparent to everybody, and to say that anyone could not do this would be to assume grave responsibilities. In case there is an individual so incompetent, my further remarks may be considered to be addressed to him.

Alkaline development is more popular in England than ferrous oxalate, so alkaline pyro development shall alone be treated. The selection of a suitable alkali is somewhat limited, since, for practical purposes, only the carbonates and hydrates of ammonia, soda and potash, have been found valuable. There appears to be an intense struggle going on among experimenters in both hemispheres to establish in some way a sort of claim to the discovery of one or other of these methods. The duty of assigning each claimant his due will come with better grace from the perpetrators of history than from my pen, so for the nonce it will be sufficient to assume that pyrogallol was known to be affected by certain alkalies before gelatine bromide plates were discovered.

Now it is known that with certain precautions, exactly similar effects—both as regards colour and density—may be produced with either of the accelerators just mentioned; therefore, in choosing a stock developer, the main consideration is to find out which alkali offers the least number of disadvantages in proportion to the advantages.

Probably ammonia hydrate gives the highest percentage of trouble, for among its attributes we find complaints regarding uniformity of strength, liability to occasion red or green fog, and in susceptible constitutions a predisposition to produce colds, catarrh, &c. The prejudicial effects complained of have induced many to abolish ammonia from the developing formulæ altogether, and instal the less harmful soda or potash, the value of which is at least equivalent.

It has frequently been stated that soda is capable of producing density even more readily than ammonia; also

that the colour of the negatives so obtained are invariably yellow; but with neither of these statements can the writer agree, as any reasonable degree of opacity may be obtained with ammonia if the necessary precautions are observed, whilst the colour of a soda developed negative need not of necessity be yellow; in fact, yellowness is always absent when a liberal proportion of pyro is employed in conjunction with sodic sulphite and sulphurous acid as originally recommended by Monroe. Some writers having expressed a doubt regarding the value of sulphurous acid in the soda developer, it might be worth while recording an opinion favourable to its use founded on the practical evidence afforded by its continued employment for some months. The negatives so obtained leave nothing to be desired—a fact fully admitted at a meeting of the London and Provincial Association, before whom several examples were shown. Why others fail to get like results I do not know; it may be attributable to the sample of soda used, or the particular sample of sulphurous acid employed.

Solution of sulphurous acid gas made by an amateur chemist is not a product to be relied on. Should any doubt exist on this point, a very simple experiment is capable of verifying the assertion. Acidum sulphurosum B. P., if tested volumetrically, will be found to require three volumes of a one per cent. solution of ammonia (reckoning strong liquid ammonia to contain 30 per cent. of ammonia) to each volume of the commercial article, and I doubt if any home-made solution of the gas obtained by displacement will give a reading higher than volume for volume. Again, cold water dissolves thirty volumes of the gas under ordinary atmospheric pressure; but it dissolves considerably more under greater pressure and at low temperatures, therefore it will be found less troublesome to use the preparation made according to the pharmacopiæ, and obtainable at any of the wholesale chemists.

It does not seem at all necessary to use a very pure sample of soda, since common washing soda (mono-carbonate) fulfils all the necessary conditions.

To obtain the most uniform results, it is better to crush the crystals up rather small, and expose them on sheets of paper in a dry atmosphere for some time until efflorescence takes place. When the salt has considerably whitened, it is in a fit condition for use, and nine ounces may be dissolved in each gallon of water used in making up the stock solution, the strength of which will be about 24 grains per fluid ounce—half this strength being sufficient for most ordinary purposes—in conjunction with four grains of pyrogallol preserved in solution by means of sodium sulphite acidified with sulphurous acid. A developer of this kind causes neither frilling or fog (provided the plates are fairly good) and may be safely relied on for equality; moreover, the dark grey colour of the film enables printing to be carried on with the same rapidity we formerly experienced when dealing with good collodion negatives. Although a soda developer such as this can be used for several plates in succession, it is not advisable to go beyond three or four plates, neither is it wise to dilute it beyond the strength named, as the prolonged development necessitated by the weakened solutions do not yield such perfect negatives.

Reviews.

DEUTSCHER PHOTOGRAPHEN-KALENDER, TASCHENBUCH UND ALMANACH FUR 1885. Von K. Schwier: *Weimar. Preis M* 1·50.

WE have here an excellent and useful little companion for the German-speaking photographer. It is, in fact, a photographers' diary, with a clear space of about one inch by three, for each day in the year. Besides containing the usual matter of an almanack, it includes an excellent summary of photographic progress during the year, formulæ, lists of members of the principal photographic associations of Germany or Austria, and much general information of value to the photographer. The book is not too large to be carried conveniently in the pocket. It is bound in cloth, and provided with a socket for the pencil.

WASHING TROUGHS FOR GELATINE NEGATIVES.

BY W. COLES.

WITHOUT going into the question as to whether hypo-sulphite of soda, or sodium thiosulphate, left in the film, is injurious or not, it may be taken for granted that all photographers make some attempt at washing it out. In the good old collodion days there was not much apparatus required. Plenty of water in the cistern, free from dirt, and a tap to let it flow out, were generally considered sufficient.

When gelatine plates first came into use it was attempted to wash them in the same way, and some do so up to the present time. It was soon found, however, that this did not well carry out the end in view, and with large plates especially the space necessary to wash in this manner was more than could be spared.

Flat dishes being already in use about the operating room, were brought into requisition, the negative being laid face upwards and covered with water, which was changed sometimes, but as often forgotten. Of all the ways of trying to wash gelatine plates this is undoubtedly one of the worst. We have in a plate, just removed from the fixing-bath, a solution of hypo, which will tend to diffuse itself into water rapidly enough, if on a level with it, but which, being heavier than plain water, has little tendency to mix with water above it, unless shaken up. If, however, the plate can be propped up in the dish with the film downwards, the hypo-solution very quickly mixes with the rest of the water; but as this is not very convenient to arrange, vertical troughs holding several plates have come into use. The grooves should, however, be set on a slant (not upright as is ordinarily the case) so that as the water next the plate becomes charged with hypo, it can sink down and be replaced by fresh. The inflow should be at the top, and the outlet at bottom. The exit is generally by a tap or syphon; if the former, there is always a difficulty in adjusting the in-and-out flow so that they balance each other; either the trough is half-empty, or water is running over. If there is a separate tap to supply the trough, the water can be kept running, provided the supply is plentiful; but where only the tap over the developing sink is available, it is often necessary to fill the trough, and stand it on one side for a time.

With syphons as usually arranged, the bend of the tube is just on a level with the top of the plates. It should be at least an inch higher. If the water is not turned off the moment the level of the top of the syphon is reached, or if in moving the trough it is tilted at all, the syphon commences to act, and continues till the vessel is empty.

The little improvement I have to suggest, which I have found to be a convenience myself, is to make a small hole on the upper side of the bend of the syphon, so that water does not run out unless the trough is full, and only continues to do so while water is running in. The advantage of this is, that whether the inflow is much or little, the trough is always full, and the water running out just as fast as it enters. I frequently at night leave the trough under the tap, and the water trickling in, with the certainty of finding it full in the morning, whether the cistern happens to run dry or not. One of the best troughs I have seen is that of Mr. Edwards, in which a perforated tube carried round the edge inside allows water to be thrown as a fine spray between the plates. If the syphon

of this had a hole at top, as I suggest, it would, I think, be an improvement. It must be borne in mind that to get the washing over quickly, it is desirable now and again to empty the vessel completely. If a strip of metal is made to slide in grooves so as to close the hole when required, like the ventilators in a railway carriage, the ordinary action of the syphon can be obtained, and the water drained off. Large troughs should on this account be fitted with a tap having a good-sized bore, as well as a syphon. In practice it will be found better to have two or three small troughs for different sized plates, than one large one holding several sizes. The water in the smaller ones being renewed more frequently, the washing is better done.

THE ACTION OF LIGHT ON SILVER COMPOUNDS.

BY P. C. DUCHOCHOIS.

In the communication of a theory of the action of light on silver salts I made in June, I certainly made no pretence of having solved a problem which has always embarrassed photographers since the early days of the discovery of Niepce and Daguerre.

I know that the development of the latent image by reaction would not be accepted without comment, and would, perhaps, revive a discussion always interesting to those who have studied the changes light effects on certain compounds. I did not, however, expect to find among the opponent photographers who sustained —and not without good arguments—the physical theory to explain the formation of the image by a deposit of the silver reduced by an acid developer, for the dynamic theory, if it can be so called, explains in a similar manner the alkaline development. If the molecular change—or motion—imparts to the silver salt the property of attracting particles of metal, it may also cause the reduction of the insolated salt by reagents possessing a great affinity for the haloid which tends to separate from its combination with silver, as shown by the behaviour of an iodide of silver film which can be developed by an acid or alkaline developer, the image acquiring, however, in the latter case, little or no intensity.

It has been objected that in the impossibility of drawing a limit where the reduction becomes visible, it can be assumed that the invisible image is identical with the visible one. But the atomic motion necessarily preceding the chemical change, which is only a consequence, one may as rightly say that the action of reagent is altogether independent of any reduction, and results from the separation of the elements forming the bi-atomic molecules which become momentarily mono-atomic, and therefore in a state favourable to form new combinations; moreover, that impressions can be obtained without the direct intervention of light in circumstances which hardly admit that a reduction could be effected. I allude to the images of Moser and to the experiments of Hunt, Draper, and Niepce de St. Victor. Among the experiments of Moser I will cite the following, which is certainly very interesting:—A silver plate was iodized after the manner of Daguerre, and, at night, a medal cut in agate, an engraved silver plate, a horn ring, and several other objects were placed upon it. The plate was afterwards exposed to the vapours of mercury, and the image of each of these objects was perfectly reproduced. But the most extraordinary result obtained by Moser to show that this phenomenon was not due to an action of contact is, that these images were also produced in the most complete obscurity by bodies placed at a small distance from the iodized plate. From his researches Moser concluded that "all bodies radiate light in in the dark," and that "there is latent light as well as latent heat." R. Hunt was led to attribute this phenomenon to a different cause. His hypothesis, which he sustained by many ingenious experiments, was that they were due to an exchange of heat between the bodies placed in presence. At the time the experiments of Moser and Hunt were made (1841-1842), the correlation of the forces was not scientifically established; hence, probably, the divergent theories. To-day they could easily be concilliated, since heat and light are the same mode of motion.

It is hardly possible to imagine that in these experiments the latent image is formed by a chemical change, and if a deduction based on analogy has any value, one can admit that there is no reduction also when the light acts on the silver salts for the fraction of a second; moreover, that no means can detect any trace of elimination of the haloid, although the ten-millionth of one grain of bromine to the square inch eliminated from a 40 by 36 inch plate exposed under a thin layer of water would suffice to form a precipitate. The fact that an exposed plate can receive another impression when kept in darkness for a certain period, tends also to prove that no reduction has been effected, for, as the haloid has been evolved, how could this remarkable phenomenon be explained? Let us, however, suppose *a priori* that the silver salt is reduced either to a sub-salt or to metal. If the latent image be formed of metallic silver the development (alkaline) is inexplicable otherwise then by the theory now under discussion. This needs no comment; the silver being already reduced, the reaction can only be that of a substitution of base. As to the reduction in a sub-salt, it has been shown in the former paper that the insolated silver chloride was a mixture of silver and of unaltered salt. The arguments and the deductions from the analyses were objected to because—first: The sub-salt does not directly result from the dissociation of the haloid, but from the combination of the metallic silver in a nascent state of reduction with the silver chloride not acted on by light (?); second: The insolated substance is insoluble in nitric acid, and can even be formed under that acid; third: The isolated substance is a compound of a sub-silver salt first formed, of metallic silver resulting from the reduction of the sub-salt, and lastly of unaltered chloride.

The insolubility of the reduced salt—or a part of it—in nitric acid, is certainly a very remarkable fact, but not conclusive. The anomaly may arise from an allotropic modification or from a peculiar arrangement of the metallic particles with the unaltered silver salt. There are even some cases of isomerism which are more curious; such is that of the ferric hydrate, which becomes insoluble in acids when kept under water for some time.

The last objection has a certain value, and deserves to be taken into consideration, as the previous analysis may leave a doubt on the real composition of the insolated substance. A series of experiments were accordingly made, and, instead of investigating whether the haloid disengaged during the insolation was an equivalent of that necessary to combine with the precipitated silver. The solvents were also tested for chlorine or bromine, for, if one of the components of the insolated salt be a sub-salt, the liquid ammonia employed to dissolve the unaltered salt and precipitate the silver from the sub-salt must contain the haloid:—

$$3(AgCl, +Ag_3Cl) + 4NH_3 = 3AgCl + 3Ag_2 + 3NH_3, HCl + N,$$

or,

$$3(AgBr, +Ag_3Br) + 4NH_3 = 3AgBr + 3Ag_2 + 3NH_3, HCl + N.$$

The analysis showed no trace of either chlorine or bromine in the solvents after the unaltered salt had been precipitated by neutralizing the ammonia with nitric acid. Two grains of silver nitrate were used in each experiment, and after the addition of half a grain of sodium chloride or bromide at once formed a precipite with the silver nitrate added. In acid the silver bromide after one hundred hours' insolation, was hardly discoloured, only 0·55 grains of bromine having been eliminated, while under water the elimination was 2·17 grains. The silver chloride in the same circumstances gave 2·65 grains chlorine in acid, and 3·96 grains in water. In these experiments 68 grains of silver nitrate were precipitated by a slight excess of sodium chloride or bromide, and the silver salts washed by decantation before being insolated. The compounds insolated in water were partly insoluble in nitric acid, and the amount of silver found in the solutions, together with that precipitated by ammonia, was as near an equivalent of the haloid eliminated by the luminous action as can be expected in such analysis. The results were as follows:—

1. *From the silver bromide insolated in nitric acid.*

Silver bromide from the haloid in the acid	1·29	grains
Silver bromide from the silver precipitated by ammonia	1·45	,,

2. *From the silver bromide insolated in water.*

Silver bromide from the haloid in the water ...	5·10	,,
Silver bromide from the silver dissolved by nitric acid	1·20	,,
Silver bromide from the silver precipitated by ammonia	4·625	,,

3. *From the silver chloride insolated in nitric acid.*

Silver chloride from the haloid in the acid ...	10·70	,,
Silver chloride from the silver precipitated by ammonia	11·30	,,

4. *From the silver chloride insolated in water.*

Silver chloride from the haloid in the water ...	16·00	,,
Silver chloride from the silver dissolved by nitric acid	2·05	,,
Silver chloride from the silver precipitated by ammonia	15·10	,,

It is manifest, therefore, that the theory based on the formation of a sub-silver salt cannot stand the test of experiment, which proves without contest that the reduction is entire; that consequently the visible image is formed of metallic silver before fixing, and that although it may be supposed, as the contrary cannot be demonstrated scientifically, that the invisible image consists of particles of reduced silver, the alkaline development is nevertheless independent of that reduction, and results, as before explained, from an atomic motion which, in attenuating the affinity of the haloid for the silver, causes the former to combine with the reagents, and thus to deposit the metal which ultimately forms the photographic image.—*Anthony's Bulletin.*

Notes.

As one who has made a special study of out-door photography in winter time, Mr. Renwick stands pre-eminent, and his view taken across the Trent, with Stapenhill Church just visible through the haze, almost chills one when looked at. Those who propose to take out the camera during the next few months would do well to read Mr. Renwick's article on page 826.

Frost studies would make excellent Christmas cards, suggests Mr. Renwick in his paper: and he follows up his words by sending us half-a-dozen cabinet pictures, mounted on cards with suitable inscriptions. A little effect is realized by sprinkling the surface with the thin blown glass or "glitter," so much used for decorative purposes.

More Christmas Cards come to hand, those sent by Mr. Duncan, of York, being especially worthy of mention; a view of the Cathedral, the city arms, and a suitable inscription being tastefully combined.

The Sultan is, as we previously hinted, about to set an example which might well be followed over here by the masters of large households. The Commander of the Faithful having, it would seem, some difficulty in knowing who does and who does not belong to his domestic establishment, has issued an order for everyone to have his or her photograph taken. The list is to commence with the ladies of the harem, some of whom, so rumour has it, are personally unknown to his majesty; then follow the household employés of a superior order; then the servants and workmen; while at the bottom of the list figure the chief ministers of state and their clerks. All these photographs, the number of which the imagination dares not picture, are to be contained in one gigantic album which is now in course of preparation. A volume of the *Times* will be nothing to it.

The micro-photograph, as mounted on one end of a kind of Stanhope lens, is a familiar object to our readers; and the cheapness with which these can be produced commercially is surprising, as photograph, lens, and the fancy article which serves for a mount are often sold retail in the bazaars of Paris for half-a-franc—something less than fivepence.

In our "Patent Intelligence" will be noticed a curious suggestion, Mr. Galland-Mason proposing to mount a series of minute lenses and photographs on the top of one's spectacles or eye-glasses. Under these circumstances one might have at hand a series of maps of a district while travelling; a lawyer might carry a reduced copy of the more important notes of his case; or the detective might carry a whole album of portraits, and, while looking out for a suspected character, he could be studying his photograph.

We have already pointed out that micro-photographs might be applied to some of the above-mentioned purposes, and we cannot help thinking that for general purposes it would be better to group the lenses in separate mounts, somewhat after the fashion of the chambers the in breach of a revolver, than to mount them on the rim of one's spectacles, as now suggested.

The American photographer who tried the experiment of telling his sitters to look at the notice "Positively no Credit," while the exposures were made, has secured a fine series of pictures illustrative of the sentiment of discontent.

Among filtering materials, few substances have so many good qualities as are possessed by asbestos. It is not acted upon by water, wine, beer, vinegar, or petroleum; and but few of the solutions used in the photographic laboratory attack it. Dr. Weichselbaum says that if packed closely, it is, perhaps, the very best medium for freeing drinking water from spores and germs. Mere heating to redness serves to restore the asbestos, however loaded with organic matter it may have become.

During the past eight or ten years the trade in asbestos has become one of great importance, large quantities of the material having been found in the mountainous districts of North Italy.

According to Mr. P. L. Simmonds, who contributes a comprehensive article on "The Timber Supplies of Great Britain" to the *Journal of the Society of Arts*, box wood is getting extremely scarce, and the wood engraver will shortly have to find a substitute. Photography, however, comes to the rescue with the various chemigraphic processes as substitutes for wood engraving. At the present time one may estimate fully one-half of the block work done for illustrated periodicals to be "process."

The Austria-Hungarian Bank has adopted the Waterhouse process of photo-engraving for the production of bank-note plates.

A carbon print is developed upon a silvered coppered plate, and upon this as a mould, copper is deposited by the electrotype method until a plate about one-eighth of an inch thick is produced. These plates, when coated with steel by the method of Joubert, are said to yield 50,000 impressions; the printing being done on a machine.

G. RENWICK, BURTON on TRENT. COPYRIGHT

WINTER.

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picture behind. The distance is so short that, coming from the busy High Street, one cannot suppress an exclamation of surprise at the scene that bursts on the view. Here, from various points, I have taken some of my prettiest pictures, both in summer's heat and winter's frost; and though I have seen much of the vaunted scenery afar, that tourists delight to honour, yet for simple beauty I have found none to excel this favourite spot at home. I have spoken of winter's frost, for, thanks to the introduction of the dry plate, the photographer can now wrest his picture even from the cold grip of the frost king, and the beautiful effects of the hoar-frost can be seized by the camera and made into a picture, upon which one may gaze with delight in all seasons of the year. Many a photographer, before the invention of the dry-plate, has longed to catch the hoar-frost before the envious sun had melted its beauty, or the bustling wind had blown it away. It must be caught in a motionless air and while still freezing; and under such circumstances many a disappointed operator has found that, before his purpose could be effected, his old-fashioned wet plate had become a plate of ice.

I took some of my prettiest hoar-frost views on one of the coldest November mornings I can remember. A heavy fog hung over the town, such as we occasionally do get down the valley of the Trent, when, perhaps, in more elevated places, little of it is seen. The cold was severe, and the hoar-frost everywhere, no single straw in the street having escaped. The light was very feeble, in consequence of the fog; but I thought it an opportunity not to be lightly neglected, so I looked out my cameras and determined to do my best. I took three cameras, sizes 12 by 10, 10 by 8, and a half-plate. I took a dozen plates. The lenses I used were a 12 by 10 Dallmeyer's rapid rectilinear and an 8½ by 6½, same make, using this latter for the 10 by 8 as well as the half-plate cameras. My man looked blue as he assisted me to pack up; and presently he asked if I intended to try the "wet process?" I replied, "Certainly not"; but discovering a merry twinkle in his eye, I could not forbear laughing. I put him through the "wet process" by means of a bottle of Bass's best, warmed up my own system in like manner, and we started for the artistic realms of "Jack Frost." I nearly ran against my medical adviser in the fog. He noted the cameras, and said, derisively, "You can't do anything in photography on a day like this; the light you want will be *mist*." I smiled at his *hazy* pun, and told him that what *could* be seen could be photographed.

My experiment succeeded well; for, of the dozen plates I took with me, I made as many successful pictures. That presented herewith was one of that dozen. The fog had lifted a little, and I was just enabled to distinguish the village church of Stapenhill at no great distance. I wanted that, if it were possible, so I selected for the foreground a single-plank bridge, over a narrow section of the Trent, overhung by two old willow trees, glorious in their garb of hoar-frost. The bridge is used chiefly by anglers and bathers in the summer time, commodious dressing-rooms being provided for the latter, and both angling and bathing are free. Ugh! it made one shiver to think of those pleasant recreations just then. The parted palings show the cattle ford to and from Alligator Island, on which stands the solitary tree in the picture. A little to the right, but, unfortunately, just out of reach of the lens, is situated the antiquated halfpenny ferry, the boat being plied all day long between the Burton and Stapenhill banks of the Trent—a nuisance to the hurried man of business, but to the artist or antiquarian a scene of primitive beauty, and a relic of the good old times.

It was too cold on the day of which I speak to waste any more sentiment than was needed in the pictures, so having exposed my stock of plates I hurried homewards, intent on dealing with plates of a more substantial character, and of rather a warmer kind. I must not omit to say that I used for my pictures the prepared plates I obtained from Messrs. Fry and Co., and the exposure I allowed was thirty seconds, using smallest stop. I did not develop the pictures on the same day, as the light was not favourable. An over-wecning anxiety to see the results I had obtained would have been fatal to the whole. When they were developed I felt well repaid for the cold exposure both they and I had undergone.

Since these pictures have come within our reach I do not find they have been used for a purpose to which I think they are admirably adapted—viz., Christmas and New Year Cards. If printed in platinotype, they would make a valuable acquisition to that pleasant custom, and would be rendered permanent pictures. No colour would be needed, for an obvious reason. Unlike many of those now in vogue, they would be *bona fide* representations of one of winter's most beautiful phases, and faithful exponents of the Psalmist's exclamation, "He scattereth the hoar-frost like ashes. He casteth forth his ice like morsels: who can stand before his cold?"

FILM NEGATIVES FOR TOURISTS.

BY ARNOLD SPILLER.

Of the whole kit included in the photographic tourist's knapsack, nothing is so weighty or fragile as the packet of sensitive plates. In fact, it is the plates that debar the pedestrian tourist from carrying a larger apparatus than the so-called pocket camera. Whilst touring in Switzerland last summer, I used a 7½ by 5 apparatus, but then part of my route lay along the St. Gothard Railway, and thus I was able to send on a supply of plates by rail. Notwithstanding this help, I found that the couple of dozen or so sensitive films which I was, of course, obliged to take with me, added very considerably to my burden, and made the latter almost unbearable. It generally happens that the finest scenery is met with where the iron horse has not yet put in its appearance, and thus one is not able to avail oneself of its aid. Then, again, think of the predicament one is put to if, on enquiring at the luggage office, it is found that the baggage has not arrived.

It is thus evident that any practical substitute for glass to support the sensitive film, corresponding to the calotypic or collodio-bromide tissue processes should be hailed with joy, and add, to no small extent, to the capabilities of touring photographers. I do not propose to enter now into a historical account of the various methods designed for carrying out the desired end; suffice it to say that from my experience with the "negative-paper" prepared on the lines indicated by Mr. Warnerke some three years ago, and recently introduced into the market, I believe the application of photography to the requirements of the photographic tourist has entered upon a new era.

The "negative paper" is apparently prepared by coating paper, which has first received a substratum of hard gelatine, with gelatino-bromide emulsion. The material can be obtained either in single sheets or in bands. In the latter form it is used with the well-known roller-slide, the numerous advantages of which over the ordinary double back can hardly be too highly estimated. In the first place, the apparatus and sensitive tissue sufficient for fifty exposures are only slightly heavier and more bulky than a couple of dark slides; then again, one's daily exposures are only limited by the number of unexposed films that are on the roller, whilst with carrying three double dark slides, the number of exposures cannot exceed six, unless the somewhat inconvenient changing bag be used.

Another important advantage of using the roller slide is pointed out in the late Mr. Baden Pritchard's delightful paper entitled, "Photography from a Holiday-Maker's Point of View*." He said, "There is no changing of plates when you get home, and of all the tedious and distressing labours that a fagged-out pedestrian can be called upon to

* Photographic News, March, 1877.

perform, while his comrades are in bed and asleep, that of unpacking and re-packing dry plates, dusting and labelling them, and putting them in or taking them out of the slides, is about the worst. It is often, too, difficult to secure a suitable place for the purpose. In Norway, I remember, I was very much put out on this account. I meant to change my plates, as usual, at night-time, but found I had reckoned without mine host; to my dismay, it was as light at midnight as it is in England on a summer's afternoon. With the roller dark slide such difficulties as these fall away altogether."

Although I consider the roller-slide very valuable, at present my experience with the "negative paper" is confined to the use of separate films exposed in the ordinary dark slide. If the latter opens in the centre, and the plates rest on the rabbets, then a sheet of the sensitive material, cut to the exact size, is placed on the rabbets, and a solid support, such as a plate of glass or ebonite, is inserted behind. When the slides are of the solid form, and plates rest on the four corners only, it is necessary to use carriers made specially for the purpose.

The negative paper is made in two grades of sensitiveness; the *ordinary* ranges from 10 to 19 on the sensitometer, the *extra-sensitive*, from 20 to 25.

Before describing in detail the after treatment of the exposed film, it will be as well to remind the reader of the principle of the process. The film is first developed with alkaline pyro, whereby not only is the sensitive salt reduced, but also the gelatine in the immediate neighbourhood of the deposit is tanned by the product of oxydation of the pyro, and this becomes insoluble in warm water. The developed film is placed, face downwards, on a glass plate, and pressed tightly in contact with it. The plate, to which is attached the film, is immersed in warm water, the paper soon peels off, and the gelatine, containing the unacted-upon silver salt, dissolves away, leaving the developed image bare, and thus not requiring the usual fixing with hypo.

So far for the principle of the process. Here follow the details. The manufacturers advise for development the pyro-potash solution, as given on page 766; but I find that this solution is hardly sufficiently restrained, so I prefer to use the ordinary pyro and ammonia developer. Of course, as with gelatine plates, it is impossible to prescribe a universal formula, but the following may be taken as a fair standard for rapid films:—

A—Pyrogallic acid	...	...	...	8 grains
Citric acid	...	...	...	2 „
Water	...	...	...	1 ounce
B—Ammonia (·880)	...	...	...	4 drams
Potassium bromide		...	...	40 grains
Water	...	...	...	10 ounces

For a quarter-plate use 1 dram each of A and B diluted to 1 ounce with water.

The film is placed in the dish, and the mixed developer is poured on direct, without previous moistening. The process goes on just as with a plate, the image being sufficiently dense after some five minutes' treatment. After slightly washing in water, it is ready for transferring to the glass support, which process can be done in yellow light, or even gaslight.

In order that no time should be lost between the processes of development and transfer, before developing a glass plate of best polished crown or patent plate, measuring at least a quarter of an inch each way larger than the film, should be covered by means of a camel's hair brush with powdered French chalk, cleansed, and finally polished with a washleather pad. The plate is then covered with plain collodion and placed in a dish of water, so that by the time the development is finished, the greasiness on the collodion film will have disappeared. The developed negative is placed face downwards on the collodionized plate, and both are removed together from the dish, taking care that there are no air-bubbles between the two surfaces. Two sheets of blotting-paper and one of brown paper—or better still, india-rubber cloth—are placed on the back of the paper negative, and then thoroughly rubbed with a squeegee in order to press out as much water as possible between the gelatine and collodion films. It will be now found that on taking away the blotter, the negative paper will stick firmly to the glass, so that after allowing it to stand for ten minutes or so, it is ready for the warm water bath.

The plate is next put in a good deep dish containing plenty of water, which should be warmed to a temperature of about 100° F. After about a minute's soaking, the paper support can be peeled off; the gelatine and sensitive salt, unacted upon by the developer, is then removed from the image by gently brushing with a tuft of cotton-wool or a "Buckle's brush," while the film is still immersed in the bath. As a trace of the silver-salt generally clings to the surface of the film, it will often be found necessary to soak the plate in hypo, which will immediately clear the deposit. As there is such a comparatively small proportion of gelatine in the deposit, only a very slight washing is required to move the fixing salt. If the image is not dense enough, it can be intensified by the pyro and silver solution, or any of the methods used for carbon prints; but in my experience nothing is so simple as the treatment with mercury, and then with silver and potassium cyanide. It should be remarked that if the films be under-exposed, and the process of forcing by adding more ammonia be resorted to, the whole film will become more or less insoluble, and the plate will especially require fixing with hypo. On the other hand, if it is necessary to develop with a solution containing less than the normal proportion of ammonia, as with over-exposure, very slight insolubility of the image will take place, so that after the paper has been peeled off the plate, the latter should be placed directly in the hypo bath, without risking the treatment with the Buckle's brush.

To return to the negative: while it is attached to the plate, it is reversed, so that unless it is required for the "single-transfer," or kindred processes, the film must be stripped from its support.

A sheet of gelatine—such as is used for tracing engravings, and to be obtained from Messrs. Corneleisen, of Great Queen Street—is soaked in water until pliable, and then squeegeed to the film on the plate. After drying, the film may be easily separated from the glass by a little help with the penknife. In conclusion, it should be remarked that such film negatives can be printed from either side, a fact of considerable importance.

WITH THE BRITISH ASSOCIATION.

BY R. G. BROOK.*

WHEN the meetings of the British Association were over we dispersed in different directions. I decided to go to Ottawa on my way to Toronto, as I wished to call at Sharbot Lake, both to take views and get a day or two's fishing, and on this trip my first experience with the "baggage smashers" occurred. This is a very appropriate name for the porters on the American railways, and my first transaction with them convinced me of its accuracy, for on handing a parcel of eight dozen plates over the counter at Montreal, a demon of a fellow pitched it head-over-heels down a wooden shoot into some region below; I expected to find most of them broken, but I had taken the precaution to have strong tin cases made to hold each two dozen, and these again wrapped up in strong paper secured with leather straps. When I next met with the parcel, I found one dozen plates broken, and afterwards never parted with it in spite of all the grumbling of the car conductors about having too much luggage in the car.

At Ottawa I got a view of the Houses of Parliament, one

* Continued from page 789.

"After trying many experiments in double mounting on muslin, I have adopted the following method. I prepare several yards of cloth at a time by sizing with starch, and always keep a roll of it on hand ready for use. While damp the cloth is stretched not too tightly on a frame, and sized pleutifully with warm starch paste made rather thin, and spread on evenly. Where large quantities of muslin are used, perhaps tenter bars might be employed to advantage for stretching. When dry cloth is cut to the size required before mounting, allowance being made for the expansion of the prints, if the starch for mounting be used while warm (which I think is preferable), it should be as stiff as can be conveniently spread on the print, for the reason that it will expand the cloth less and dry quicker From the moment the first print touches the cloth dispatch is important; therefore both prints are first pasted, one being laid aside ready to be picked up quickly. The first print is rubbed down with a hand roller, which can be done more expeditiously than with the hands. When the second print is properly laid on the side there is less occasion for haste, and rubbing down by hand is preferable; because, although the roller does the work perfectly on the first print mounted, it is liable to leave air-bubbles in rolling down the second one. To avoid bubbles in the hand rubbing, the strokes should be toward the middle of the print, and not in every direction from the centre. When the mounting is completed, the prints are placed between papers and covered immediately with several folds of cloth of sufficient weight to keep them in place. To facilitate drying they may be aired after an hour or two, and placed between dry papers and again covered with the cloth."—*Scientific American.*

Correspondence.

"THE QUALITY OF THE SMILE."

DEAR SIR,—The above expression in last week's NEWS prompts me to say that every one who has skipped in a studio, or roved with a camera, must feel that they owe a debt of gratitude to Mr. H. P. Robinson for his continuous efforts to ennoble the art of photography. No man has laboured so long and so assiduously to place the latest-born of the Arts in the first rank of æsthetic form. Over and over again have I seen and felt the artistic ring of his mind in both his graphic and literary work. Doubtless, innumerable photographers have done the same, although it must be confessed they have not all absorbed the fructifying essence in volume enough to enable them to throw over their productions the unnamable aroma of true art; not that all may not be trying their individual best, but to catch hold of the principles of vitalising form requires not only a searching eye and analytic mind, but a keen and rapid perception of things fitting and beautiful. Without these qualifications and attainments it will be hard to know "The Quality of the Smile," or any of the other qualities adorning enjoyable art.

Quality in art! It is as rare and partial as any good thing can well be. Look, for instance, at the works of the President of the Royal Academy, and you will feel that it is the quality of the form which engages you; but rob them of their sculpturesque grandeur, and see if the colour don't vex you now it is the other way. Glance at the early morning pictures of Corot, and the quality of the colour will entrance, while the form will perplex and tantalize; and so in modified detail the same sermon on quality may be preached all round.—Yours, &c., J. PATRICK.

Edinburgh.

Proceedings of Societies.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 18th inst., Mr. W. H. PRESTWICH in the chair.

Mr. W. E. DEBENHAM announced, with feelings of the deepest regret, the death of an esteemed member, Mr. Henry Greenwood, which occurred on the 16th inst.

The CHAIRMAN expressed his sorrow in suitable terms, and said his own sentiments were in accord with those of all the members of the Society. A vote of condolence was then passed, and the Secretary was requested to forward a copy of the resolution to the relatives of the deceased gentleman.

Messrs. MARION and COMPANY then demonstrated the method of printing and toning their *Britannia Alpha Paper*, and exhibited several specimens illustrative of its capabilities.

Several exposures were made under negatives of fair density, for periods ranging from nine to forty seconds respectively, within a few inches of the source of illumination, which was a pair of albo-carbon gas jets, ranged parallel, and six inches apart; this form of light being said to possess three times the actinic power of the ordinary gas burners of similar size. Daylight exposure would have required three or four seconds. The prints were then developed with ferrous-oxalate, the formula being:—

No. 1 Solution.

Oxalate of potash	...	...	1 pound
Bromide of ammonium	...	...	320 grains
Warm water ...	...	...	64 ounces

Filter—

No. 2 Solution.

Sulphate of iron	...	4 ounces	250 grains
Water ...	...	80	,,

Equal portions of Nos. 1 and 2 were used, and development was complete within five minutes. The further treatment of the proofs consisted in passing them through several changes of water, then soaking fifteen minutes in a saturated alum solution, and after well washing the alum out, toning in the following bath, which took rather less time than ordinary albumenized paper does.

Toning solution:—

Water ...	...	...	...	1 pint
Acetate of soda	...	...	...	60 grains
Chloride of lime	...	...	...	4 ,,
Chloride of gold	...	...	...	2 ,,

Fixing in hypo and washing concluded the demonstration. In reply to queries, the demonstrator said his rule was to use a given quantity of developer for as many prints as he could pass through in fifteen minutes. One print would set up sufficient decomposing action to render the bath useless ten minutes afterwards, so that several should be developed at the same time. The length of exposure determined the final tone—too little gave blackness—too much, redness; over-exposure and under development favoured the purples, and under-exposure with over-development the greenish and grey colours. Regarding suggestions to add salt or bromide to check developing action in the first washing water, he said it might be found to answer.

Mr. A. CLARKE passed up a print for development made on alpha paper by aid of the lamps, while journeying in a railway carriage that evening; the negative, which was very dense, required four days to get a print off in the ordinary way. A good result was obtained.

Mr. W. K. BURTON had used the paper, and succeeded very well with it. He considered it would be the printing process of the future.

In answer to a query regarding spotting out, the CHAIRMAN observed that albumen was a satisfactory medium to mix the colour with; when dry, it would be coagulated with methylated alcohol.

Mr. COWAN and others supported this statement.

Mr. A. L. HENDERSON showed an opal; the colours not being satisfactory, he toned it with acid gold and alum. The edges had since become pink. Had hypo and gold been employed, he believed the change would not have taken place. Gold and gelatine had formed an unstable compound in this case, so he thought.

Mr. LEON WARNERKE said he found yellow-stained films required enormously greater exposures for papers similar to that just shown, than was requisite when the shadows were free from that colour.

A vote of thanks having been passed to Messrs. Marion and Co.,

Mr. T. HEINRICH TRINKS said he was sure the Society had gleaned much information. It occurred to him that a well-fitted dark-room was much needed by the Society for demonstrative purposes; he therefore proposed a fund should be started for that purpose, and headed it with £5 5s.

A prolonged discussion ensued, but no definite decision was arrived at.

The Society then went into Committee, when the following resolution was carried:—"That the prize of five pounds offered

by Mr. Trinks be given, not to a specific article, process, or such like, proposed as a matter for competition, but be given for whatever original article, improvement, matter, or proecss of any kind may be brought bcfore the Soeiety by a member, and which shall appear to be of the greatest benefit to photographers in general; a limit of time to be fixcd at six months, and the determination to bc by a ballot of the whole Society. A condition to be that all details eonnccted with the matter are to be open to the Soeiety.

Mr. E. Solles was elccted a membcr of the Society.

BOLTON PHOTOGRAPHIC SOCIETY.

THE December meeting was held on the 4th inst. at the Baths, Bridgman Street, Mr. ROBERT HANROOD in the chair.

Mr. J. N. Anstwiek was elected a member of the Society.

The Rev. J. W. CUNDRY gave a lantern exhibition, the slides including an iuteresting set of Switzerland from the Lanternist's own negatives.

Dr. JOHNSON exhibited a set illustrating a recent visit to Norway, many of which elicited applausc.

Slides were also shown by Messrs. Parkinson, Dulta, Knowles, and Leueh, those of Mr. Knowles being espeeially worthy of remark.

At the eonclusion, Mr. Robert Knott moved a vote of thanks to Mr. Cundry and the exhibitors, which was seconded by Mr. John A. Walker, and suitably acknowledged by Mr. Cundry.

Talk in the Studio.

A RAILWAY CAR STUDIO.—One of the most ambitious novelties we have yet had the pleasure of inviting attention to is the Railway Studio, as our old friend, Messrs. Reed and Wallaee, of Mobile, have advised us through the medium of a little leaflet called *The Photographer on Wheels*. It is built in the ordinary form of a railway carriage 47 feet in length, 10 feet high, and 10 feet 4 inches in width. From the front platform the reeeption and ladies' room are entered, which have all the usual requirements for comfort. The central portion is the skylight, 24 feet in length, fitted with many novel applianees. The roof has a combination sash, curtains and shades, so arranged as to be shifted from side to side as the hour and position of the car may render necessary. Both the dark room and the operating room are supplied with everything for first class work. The rear is devoted to eulinary and other purposes. Under the car is a locker for rails, cross-ties, and everything necessary to form a side track, and over the ear a large substantial awuing can be drawn to afford ventilation and shelter from the sun. We are not aware of the cost, but the expense can eertaiuly not be inconsiderable, and we trust the enterprisiug gentlemen will find their venture a pleasant and profitable one.—*Anthony's Bulletin.*

COLONEL DAWSON'S POTASH AND SODA DEVELOPER. — The account of the mode of preparing this developer, given on p. 815 of our last issue, is not sufficiently full, and we are indebted to the Colonel for the following details. To make the developer, take :—

Carbonate of potash (London Pharm.)...	1 ounce
Washing soda	1 ,,
Bromide of potassium	20 grains

Dissolve the whole in sufficient water to make up a total of 20 fluid ounees. This solution may be regarded as containing ten per cent. of the mixed salts; and in mixing the developer for use, although one drachm of the above solution may be used with two grains of pyro made up to a fluid ounce with water, it is generally advisable to add the alkaline solution by degrees, and sulphite may be used with advantage. In short, the 1 drachm must be regarded as a variable quantity. In the YEAR-BOOK for 1885 (page 68), Colonel Dawson gives full particulars as to the above developer; also many hints whieh are ealeulated to prove of great value.

To Correspondents.

*** We eannot undertake to return rejected communieations.

A. G. F.—1. The most suitable glass is the "stained red," which is recommended by Captain Abney; but the "stained red" is rather deep orange than ruby. 2. An ordinary carbon print; but if you wish to go to the extreme of permaneney, you will naturally prefer a picture vitrified on enamel, 3. Thank you for your remarks.

H. M.—1. It will answer very well as a single lens, and will correspond in focus to near about the extreme length of your camera; but any marginal lines in the subject will be slightly curved, this distortion being barrel-like if the stop is in front of the lens (that is to say, if you place tho lens in the rear end of tube), or pincushion-like if the stop is behind the lens. 2. It is a matter of opinion which is to be preferred. If the leather hinges were fitted by a professed camera-maker, send the slides back to him for alteration, as it is his business to select a quality of leather which will not injure dry plates. Parchment or vellum is, however, to be preferred to leather. If brass hinges are used, very careful work is required to make the joint perfectly light-tight. 3. The simple expedient you mention answers extremely well, if a little judgment is exercised in taking care that the light from the top does not shine directly against a ceiling or other white surfaee.

COMMONER.—It will be far better for you to purchase it ready-made in the first instance.

W. H. B.—There is but little inducement to prepare dry pyrogallic acid on a small scale, as when manufactured on a large scale it can be turned out at a much less cost than when made in an amateurish way. A good method is to mix gallic acid with twice its weight of coarsely-powdered pumice-stone, and to heat the retort on a sand bath, while a current of carbonic acid gas is allowed to flow through it. Under these circumstances, pyrogallic acid condenses in the receiver; and if the work is carefully done, the gallic acid yields one-third of its weight of the pure product.

G. HERBERT.—The powder contains silver, but apparently not very much; still you cannot expect us to make an assay for you. When you add hydrochloric acid to the hyposulphite, you throw down a large proportion of sulphur, hence sulphide of potassium should be used in this case. To protect yourself in the matter of residues, you should do one of three things: 1st, reduce them yourself by fusion with an equal weight of dry carbonate of soda; 2nd, assay a small portion (after thorough mixing) by the above process, and then send the bulk to a refiner; 3rd, divide the batch into several equal parts, and send them to different refiners.

SURPRISED.—You are altogether wrong in imagining that the white cuttings from the edges of fixed vignettes contain silver. Indeed, the amount of silver to be obtained by burning ordinary fixed prints is so small as to render it scarcely worth while to preserve the cuttings, but cuttings of unfixed prints are well worth preserving.

V. BRAMBURN.—1.—As the photographs you mention have been produced by Government officials for use by the police, it is extremely unlikely that you will be able to obtain copies. 2. Without seeing them we cannot form any opinion.

ARTIST.—It may be quite true, but you have no reason whatever to be surprised at your correspondent resenting the suggestion if accompanied by such remarks.

'The Whittaker of the Photographer.'—*Chemical News*

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